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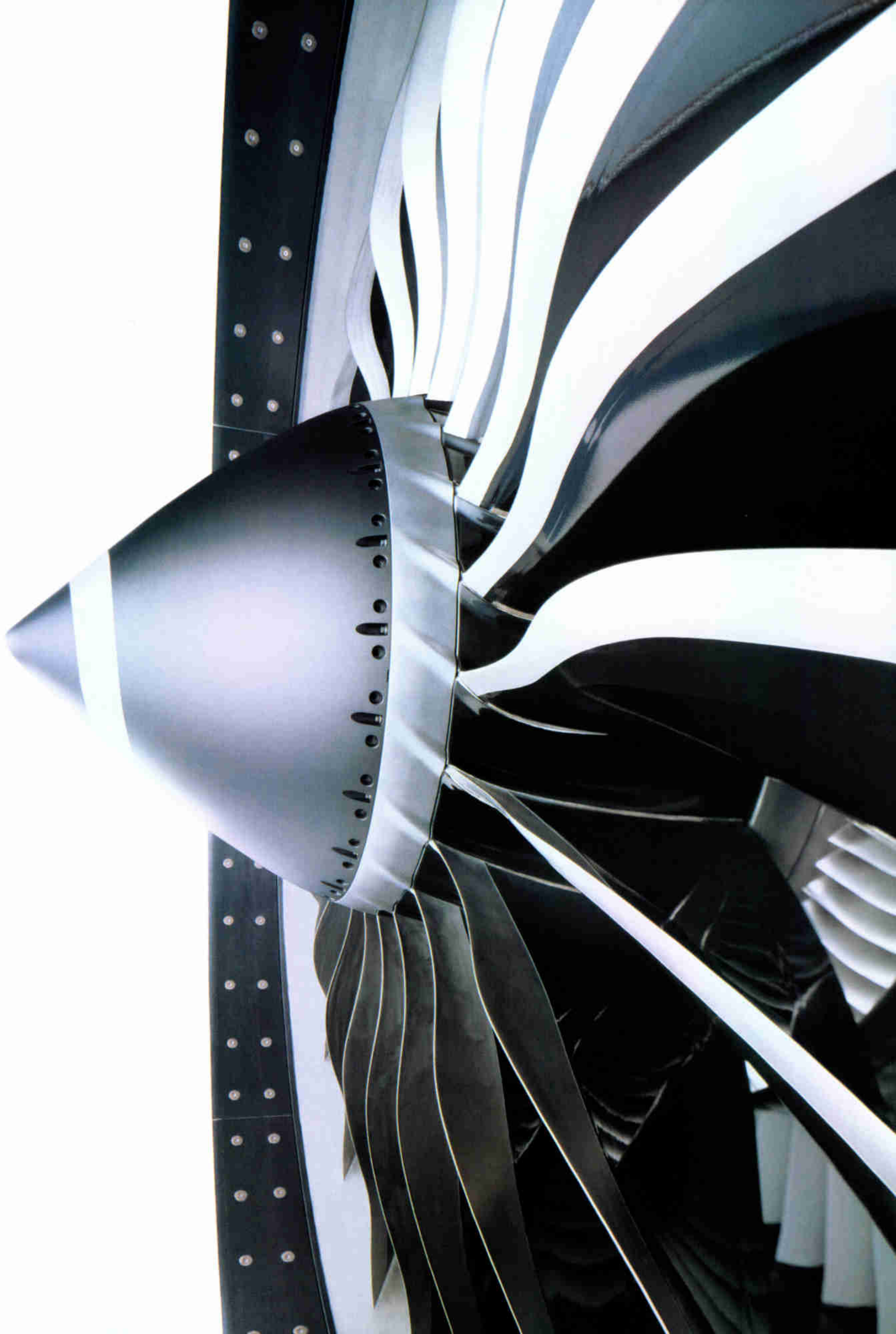
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Contents



Mount Everest—2

FEATURES



2 The world hasn't been the same since Edmund Hillary and Tenzing Norgay stepped onto Mount Everest's snowy peak on May 29, 1953. More than a thousand climbers have followed them to the summit. Nearly 200 others have perished in the attempt.

- 16 Everest's Greatest Hits** An illustrated history spanning 150 years of mountain milestones. BY MICHAEL KLESIOUS
- 30 Altitude and the Death Zone** Above 26,000 feet the human body starts to shut down. BY MICHAEL KLESIOUS ART BY TIM O'BRIEN
- 34 Not Your Average Hero** Why a beekeeper from New Zealand was the right man for the job. BY PETER MILLER
- 38 Sir Edmund Remembers** Which accomplishment gives him the greatest pride? Surprise: It's not the climb. BY SIR EDMUND HILLARY
- 42 The Sherpas** It's their mountain, and ever since tourists started pouring in, it's their livelihood too. BY T. R. REID PHOTOGRAPHS BY ROBB KENDRICK

MAP SUPPLEMENT: MOUNT EVEREST

- 72 Mayflies** With just hours to live, these swarming insects on Hungary's Tisza River have only one thing on their minds. TEXT AND PHOTOGRAPHS BY JÓZSEF L. SZENTPÉTERI
- 86 High Stakes in the Bluegrass** Million-dollar miscarriages have Kentucky horse breeders running scared. BY SHANE DUBOW PHOTOGRAPHS BY MELISSA FARLOW
- 110 Aguateca** Under enemy attack, a Maya king and his courtiers fled their city, leaving astonishing pieces of their lives behind. BY TAKESHI INOMATA PHOTOGRAPHS BY THE AUTHOR AND KENNETH GARRETT
- 120 ZipUSA: 48222** Mail call afloat on the Great Lakes. BY ANDREW COCKBURN PHOTOGRAPHS BY VICTOR JOSÉ COBO

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From the Editor
Forum
Geographica
Behind the Scenes
nationalgeographic.com
National Geographic TV
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Final Edit
On Assignment
Flashback

THE COVER

Sir Edmund Hillary in 1960, seven years after Everest.

BY YOUSUF KARSH

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This month we celebrate the 50th anniversary of the first footsteps on the top of the world, when Edmund Hillary and Tenzing Norgay reached the summit of Mount Everest. Their success blazed the trail for a string of daring climbs on the mountain, including the first U.S. ascent ten years later, sponsored in part by National Geographic. Our own Barry Bishop—

a 31-year-old writer, photographer, and geographer—was part of the team. That's Barry at left cradling the U.S. and Society flags at the summit.

(You can read his article from our October 1963 issue at nationalgeographic.com/ngm/0305.) When I joined the staff of the Society in 1969, Barry was already a legend here. After recovering from Everest, where

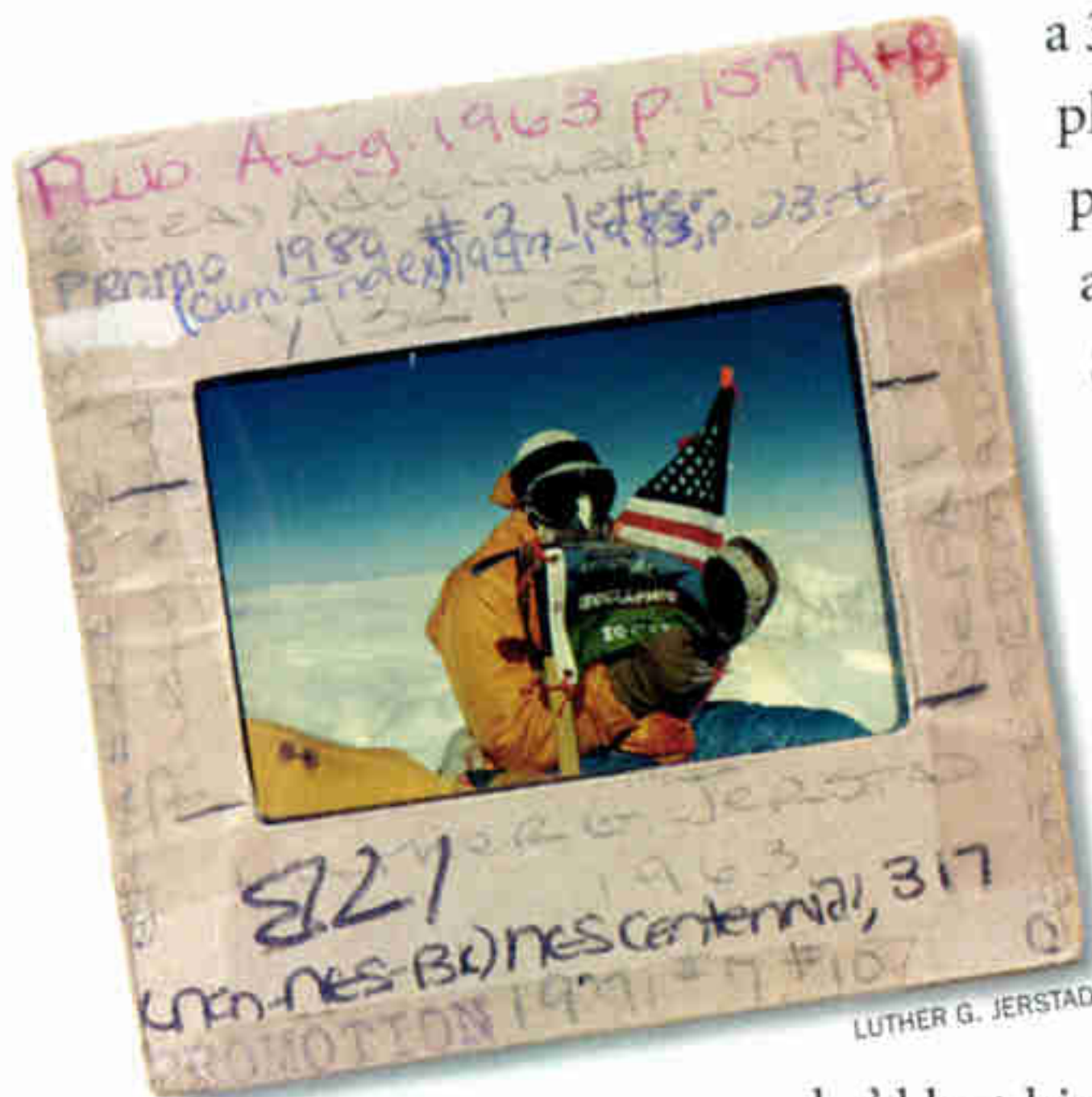
he'd lost his toes and nearly lost his life,

the cheerful man with the handlebar mustache turned his boundless energy to promoting science, eventually becoming chairman of the Society's Committee for Research and Exploration.

Nine years ago Barry was killed in a car accident. But his family's connection with Everest didn't end. Last spring Barry's son, Brent, joined Sir Edmund's son, Peter, and Tenzing's son Jamling on an expedition to the peak as a tribute to their fathers. (Watch their story, *Surviving Everest*, on the National Geographic Channel on April 27 at 8 p.m.) It was Brent's second trip to the summit, which is impressive enough. But Brent has also been instrumental in another important effort: cleaning up Everest. Since 1994 more than 20,000 pounds of garbage have been hauled off the peak largely through a buyback program in which Sherpas climbing the mountain are paid a bounty to bring down used oxygen bottles and other trash. It was a simple idea that's become a huge success. I know Barry would be proud.

Bill Allen

■ Watch my preview of the June issue on *National Geographic Today* on May 19 at 7 p.m. and again at 10 p.m. ET/PT on the National Geographic Channel.





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INDICATIONS AND USAGE

Seasonal Allergic Rhinitis

ALLEGRA is indicated for the relief of symptoms associated with seasonal allergic rhinitis in adults and children 6 years of age and older. Symptoms treated effectively were sneezing, rhinorrhea, itchy nose/palate/throat, itchy/watery/red eyes.

Chronic Idiopathic Urticaria

ALLEGRA is indicated for treatment of uncomplicated skin manifestations of chronic idiopathic urticaria in adults and children 6 years of age and older. It significantly reduces pruritus and the number of wheals.

CONTRAINDICATIONS

ALLEGRA is contraindicated in patients with known hypersensitivity to any of its ingredients.

PRECAUTIONS

Drug Interaction with Erythromycin and Ketoconazole

Fexofenadine hydrochloride has been shown to exhibit minimal (ca. 5%) metabolism. However, co-administration of fexofenadine hydrochloride with ketoconazole and erythromycin led to increased plasma levels of fexofenadine hydrochloride. Fexofenadine hydrochloride had no effect on the pharmacokinetics of erythromycin and ketoconazole. In two separate studies, fexofenadine hydrochloride 120 mg twice daily (two times the recommended twice daily dose) was co-administered with erythromycin 500 mg every 8 hours or ketoconazole 400 mg once daily under steady state conditions to normal, healthy volunteers (n=24, each study). No differences in adverse events or QT_c interval were observed when patients were administered fexofenadine hydrochloride alone or in combination with erythromycin or ketoconazole. The findings of these studies are summarized in the following table:

Effects on steady-state fexofenadine hydrochloride pharmacokinetics after 7 days of co-administration with fexofenadine hydrochloride 120 mg every 12 hours (two times the recommended twice daily dose) in normal volunteers (n=24)

Concomitant Drug	C _{max} (Peak plasma concentration)	AUC _{0-12h} (Extent of systemic exposure)
Erythromycin (500 mg every 8 hrs)	+82%	+109%
Ketoconazole (400 mg once daily)	+135%	+164%

The changes in plasma levels were within the range of plasma levels achieved in adequate and well-controlled clinical trials.

The mechanism of these interactions has been evaluated in *in vitro*, *in situ*, and *in vivo* animal models. These studies indicate that ketoconazole or erythromycin co-administration enhances fexofenadine gastrointestinal absorption. *In vivo* animal studies also suggest that in addition to increasing absorption, ketoconazole decreases fexofenadine hydrochloride gastrointestinal secretion, while erythromycin may also decrease biliary excretion.

Drug Interactions with Antacids

Administration of 120 mg of fexofenadine hydrochloride (2 x 60 mg capsule) within 15 minutes of an aluminum and magnesium containing antacid (Maalox®) decreased fexofenadine AUC by 41% and C_{max} by 43%. ALLEGRA should not be taken closely in time with aluminum and magnesium containing antacids.

Carcinogenesis, Mutagenesis, Impairment of Fertility

The carcinogenic potential and reproductive toxicity of fexofenadine hydrochloride were assessed using terfenadine studies with adequate fexofenadine hydrochloride exposure (based on plasma area-under-the-concentration vs. time [AUC] values). No evidence of carcinogenicity was observed in an 18-month study in mice and in a 24-month study in rats at oral doses up to 150 mg/kg of terfenadine (which led to fexofenadine exposures that were respectively approximately 3 and 5 times the exposure from the maximum recommended daily oral dose of fexofenadine hydrochloride in adults and children).

In vitro (Bacterial Reverse Mutation, CHO/HGPRT Forward Mutation, and Rat Lymphocyte Chromosomal Aberration assays) and *in vivo* (Mouse Bone Marrow Micronucleus assay) tests, fexofenadine hydrochloride revealed no evidence of mutagenicity.

In rat fertility studies, dose-related reductions in implants and increases in postimplantation losses were observed at an oral dose of 150 mg/kg of terfenadine (which led to fexofenadine hydrochloride exposures that were approximately 3 times the exposure of the maximum recommended daily oral dose of fexofenadine hydrochloride in adults).

Pregnancy

Teratogenic Effects: Category C. There was no evidence of teratogenicity in rats or rabbits at oral doses of terfenadine up to 300 mg/kg (which led to fexofenadine exposures that were approximately 4 and 31 times, respectively, the exposure from the maximum recommended daily oral dose of fexofenadine in adults).

There are no adequate and well controlled studies in pregnant women. Fexofenadine should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Nonteratogenic Effects. Dose-related decreases in pup weight gain and survival were observed in rats exposed to an oral dose of 150 mg/kg of terfenadine (approximately 3 times the maximum recommended daily oral dose of fexofenadine hydrochloride in adults based on comparison of fexofenadine hydrochloride AUCs).

Nursing Mothers

There are no adequate and well-controlled studies in women during lactation. Because many drugs are excreted in human milk, caution should be exercised when fexofenadine hydrochloride is administered to a nursing woman.

Pediatric Use

The recommended dose in patients 6 to 11 years of age is based on cross-study comparison of the pharmacokinetics of ALLEGRA in adults and pediatric patients and on the safety profile of fexofenadine hydrochloride in both adult and pediatric patients at doses equal to or higher than the recommended doses.

The safety of ALLEGRA tablets at a dose of 30 mg twice daily has been demonstrated in 438 pediatric patients 6 to 11 years of age in two placebo-controlled 2-week seasonal allergic rhinitis trials. The safety of ALLEGRA for the treatment of chronic idiopathic urticaria in patients 6 to 11 years of age is based on cross-study comparison of the pharmacokinetics of ALLEGRA in adult and pediatric patients and on the safety profile of fexofenadine in both adult and pediatric patients at doses equal to or higher than the recommended dose.

The effectiveness of ALLEGRA for the treatment of seasonal allergic rhinitis in patients 6 to 11 years of age was demonstrated in one trial (n=411) in which ALLEGRA tablets 30 mg twice daily significantly reduced total symptom scores compared to placebo, along with extrapolation of demonstrated efficacy in patients ages 12 years and above, and the pharmacokinetic comparisons in adults and children. The effectiveness of ALLEGRA for the treatment of chronic idiopathic urticaria in patients 6 to 11 years of age is based on an extrapolation of the demonstrated efficacy of ALLEGRA in adults with this condition and the likelihood that the disease course, pathophysiology and the drug's effect are substantially similar in children to that of adult patients.

The safety and effectiveness of ALLEGRA in pediatric patients under 6 years of age have not been established.

Geriatric Use

Clinical studies of ALLEGRA tablets and capsules did not include sufficient numbers of subjects aged 65 years and over to determine whether this population responds differently from younger patients. Other reported clinical experience has not identified differences in responses between the geriatric and younger patients. This drug is known to be substantially excreted by the kidney, and the risk of toxic reactions to this drug may be greater in patients with impaired renal function. Because elderly patients are more likely to have decreased renal function, care should be taken in dose selection, and may be useful to monitor renal function. (See CLINICAL PHARMACOLOGY).

ADVERSE REACTIONS

Seasonal Allergic Rhinitis

Adults. In placebo-controlled seasonal allergic rhinitis clinical trials in patients 12 years of age and older, which included 2461 patients receiving fexofenadine hydrochloride capsules at doses of 20 mg to 240 mg twice daily, adverse events were similar in fexofenadine hydrochloride and placebo-treated patients. All adverse events that were reported by greater than 1% of patients who received the recommended daily dose of fexofenadine hydrochloride (60 mg capsules twice daily), and that were more common with fexofenadine hydrochloride than placebo, are listed in Table 1.

In a placebo-controlled clinical study in the United States, which included 570 patients aged 12 years and older receiving fexofenadine hydrochloride tablets at doses of 120 or 180 mg once daily, adverse events were similar in fexofenadine hydrochloride and placebo-treated patients. Table 1 also lists adverse experiences that were reported by greater than 2% of patients treated with fexofenadine hydrochloride tablets at doses of 180 mg once daily and that were more common with fexofenadine hydrochloride than placebo.

The incidence of adverse events, including drowsiness, was not dose-related and was similar across subgroups defined by age, gender, and race.

Table 1
Adverse experiences in patients ages 12 years and older reported in placebo-controlled seasonal allergic rhinitis clinical trials in the United States
Twice daily dosing with fexofenadine capsules at rates of greater than 1%

Adverse experience	Fexofenadine 60 mg Twice Daily (n=679)	Placebo Twice Daily (n=671)
Viral Infection (cold, flu)	2.5%	1.5%
Nausea	1.6%	1.5%
Dysmenorrhea	1.5%	0.3%
Drowsiness	1.3%	0.9%
Dyspepsia	1.3%	0.6%
Fatigue	1.3%	0.9%

Once daily dosing with fexofenadine hydrochloride tablets at rates of greater than 2%

Adverse experience	Fexofenadine 180 mg once daily (n=283)	Placebo (n=293)
Headache	10.6%	7.5%
Upper Respiratory Tract Infection	3.2%	3.1%
Back Pain	2.8%	1.4%

The frequency and magnitude of laboratory abnormalities were similar in fexofenadine hydrochloride and placebo-treated patients.

Pediatric. Table 2 lists adverse experiences in patients aged 6 to 11 years of age which were reported by greater than 2% of patients treated with fexofenadine hydrochloride tablets at a dose of 30 mg twice daily in placebo-controlled seasonal allergic rhinitis studies in the United States and Canada that were more common with fexofenadine hydrochloride than placebo.

Table 2
Adverse experiences reported in placebo-controlled seasonal allergic rhinitis studies in pediatric patients ages 6 to 11 in the United States and Canada at rates of greater than 2%

Adverse experience	Fexofenadine 30 mg twice daily (n=209)	Placebo (n=229)
Headache	7.2%	6.6%
Accidental Injury	2.9%	1.3%
Coughing	3.8%	1.3%
Fever	2.4%	0.9%
Pain	2.4%	0.4%
Otitis Media	2.4%	0.0%
Upper Respiratory Tract Infection	4.3%	1.7%

Chronic Idiopathic Urticaria

Adverse events reported by patients 12 years of age and older in placebo-controlled chronic idiopathic urticaria studies were similar to those reported in placebo-controlled seasonal allergic rhinitis studies. In placebo-controlled chronic idiopathic urticaria clinical trials, which included 726 patients 12 years of age and older receiving fexofenadine hydrochloride tablets at doses of 20 to 240 mg twice daily, adverse events were similar in fexofenadine hydrochloride and placebo-treated patients. Table 3 lists adverse experiences in patients aged 12 years and older which were reported by greater than 2% of patients treated with fexofenadine hydrochloride 60 mg tablets twice daily in controlled clinical studies in the United States and Canada and that were more common with fexofenadine hydrochloride than placebo. The safety of fexofenadine hydrochloride in the treatment of chronic idiopathic urticaria in pediatric patients 6 to 11 years of age is based on the safety profile of fexofenadine hydrochloride in adults and adolescent patients at doses equal to or higher than the recommended dose (see Pediatric Use).

Table 3
Adverse experiences reported in patients 12 years and older in placebo-controlled chronic idiopathic urticaria studies in the United States and Canada at rates of greater than 2%

Adverse experience	Fexofenadine 60 mg twice daily (n=186)	Placebo (n=178)
Back Pain	2.2%	1.1%
Sinusitis	2.2%	1.1%
Dizziness	2.2%	0.6%
Drowsiness	2.2%	0.0%

Events that have been reported during controlled clinical trials involving seasonal allergic rhinitis and chronic idiopathic urticaria patients with incidences less than 1% and similar to placebo and have been rarely reported during postmarketing surveillance include: insomnia, nervousness, and sleep disorders or parosmia. In rare cases, rash, urticaria, pruritus and hypersensitivity reactions with manifestations such as angioedema, chest tightness, dyspnea, flushing and systemic anaphylaxis have been reported.

OVERDOSAGE

Reports of fexofenadine hydrochloride overdose have been infrequent and contain limited information. However, dizziness, drowsiness, and dry mouth have been reported. Single doses of fexofenadine hydrochloride up to 800 mg (six normal volunteers at this dose level), and doses up to 690 mg twice daily for 1 month (three normal volunteers at this dose level) or 240 mg once daily for 1 year (234 normal volunteers at this dose level) were administered without the development of clinically significant adverse events as compared to placebo.

In the event of overdose, consider standard measures to remove any unabsorbed drug. Symptomatic and supportive treatment is recommended.

Hemodialysis did not effectively remove fexofenadine hydrochloride from blood (1.7% removed) following terfenadine administration.

No deaths occurred at oral doses of fexofenadine hydrochloride up to 5000 mg/kg in mice (110 times the maximum recommended daily oral dose in adults and 200 times the maximum recommended daily oral dose in children based on mg/m²) and up to 5000 mg/kg in rats (230 times the maximum recommended daily oral dose in adults and 400 times the maximum recommended daily oral dose in children based on mg/m²). Additionally, no clinical signs of toxicity or gross pathological findings were observed. In dogs, no evidence of toxicity was observed at oral doses up to 2000 mg/kg (300 times the maximum recommended daily oral dose in adults and 530 times the maximum recommended daily oral dose in children based on mg/m²).

DOSAGE AND ADMINISTRATION

Seasonal Allergic Rhinitis

Adults and Children 12 Years and Older. The recommended dose of ALLEGRA is 60 mg twice daily, or 180 mg once daily. A dose of 60 mg once daily is recommended as the starting dose in patients with decreased renal function (see CLINICAL PHARMACOLOGY).

Children 6 to 11 Years. The recommended dose of ALLEGRA is 30 mg twice daily. A dose of 30 mg once daily is recommended as the starting dose in pediatric patients with decreased renal function (see CLINICAL PHARMACOLOGY).

Chronic Idiopathic Urticaria

Adults and Children 12 Years and Older. The recommended dose of ALLEGRA is 60 mg twice daily. A dose of 60 mg once daily is recommended as the starting dose in patients with decreased renal function (see CLINICAL PHARMACOLOGY).

Children 6 to 11 Years. The recommended dose of ALLEGRA is 30 mg twice daily. A dose of 30 mg once daily is recommended as the starting dose in pediatric patients with decreased renal function (see CLINICAL PHARMACOLOGY).

Please see product circular for full prescribing information.

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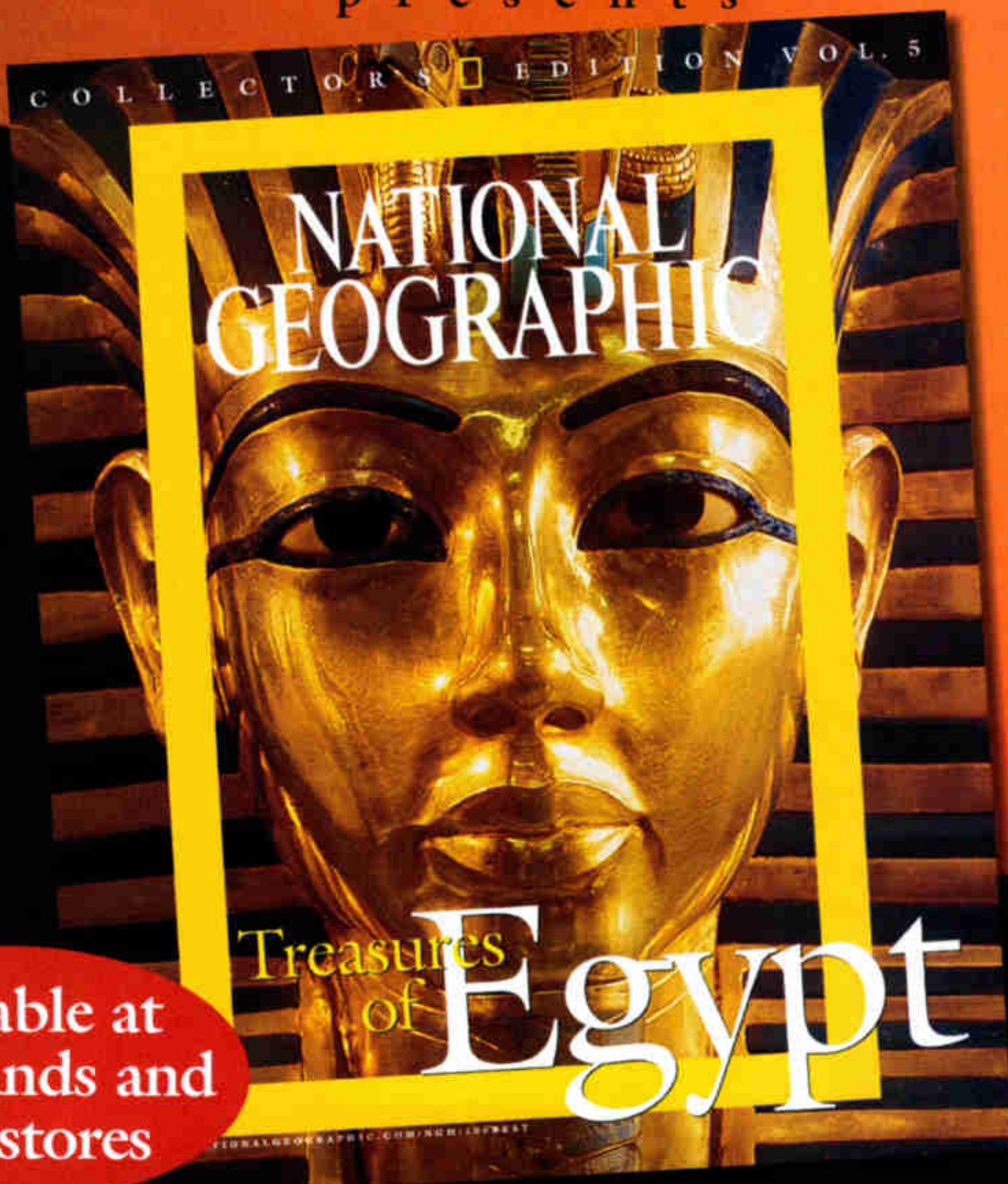
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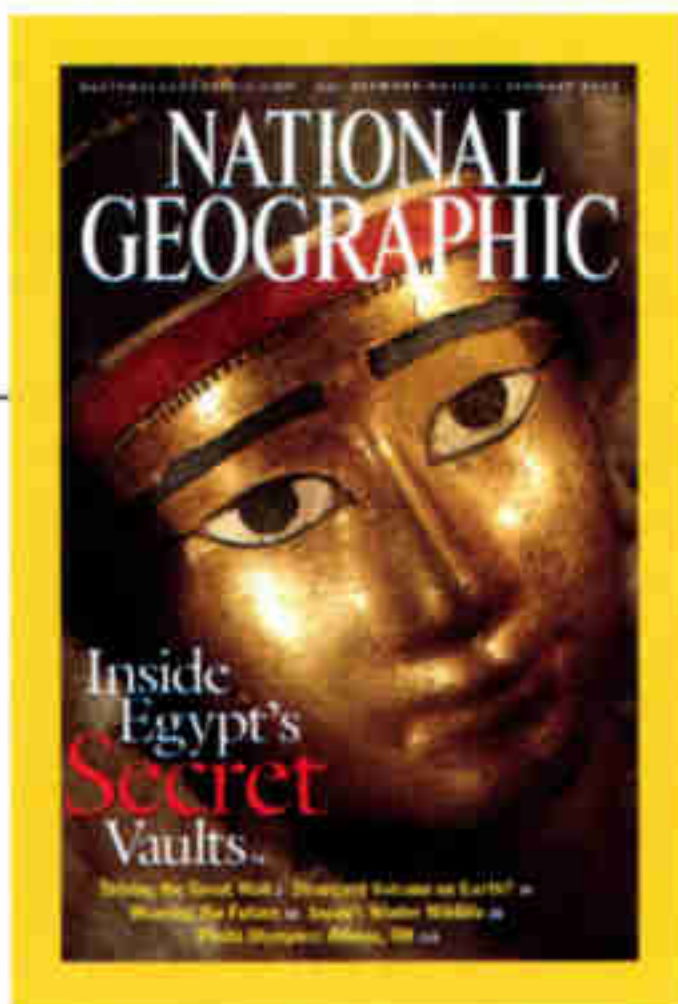
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 NATIONAL
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Forum

January 2003

A handful of photos sparked intense reactions. Many readers didn't approve of the digitally manipulated images in "Dreamweavers." Others were outraged by Michael Yamashita's shot of a live chicken being thrown to lions in China. Meanwhile, one image was singled out for praise: Tim Laman's dawn portrait of red-crowned cranes, which reminded some readers of a Japanese painting.



A Prickly Situation

I realize it sounds blasphemous, but I have been tearing out articles from the magazine for years. As a geography teacher, I file the articles for my students. The January issue did not have staples, which have been used to hold magazines together for as long as I can remember. My oftentimes bloodstained fingers thank you for removing those insidious projections that have wreaked havoc on my digits.

TIM MURRAY
Dallas, Texas

Surely you mean you have two subscriptions—one you cut up and one you save intact? Your fingers can thank our new printer, Quad/Graphics, which binds the magazine with glue, not staples.

The Great Wall

Even more than an icon, the Great Wall is a representation of the ancient Chinese way of thinking. The Middle Kingdom

always looked down on foreigners. It needed something to separate what it considered a perfect and advanced civilization from the rest of the barbaric world. China has paid and is paying dearly for her past insolence and pride. I hope China today can use the wall as a highway to the world and never forget the lesson learned when she fell from her throne of power.

ZHENG WANG
Kitchener, Ontario

I found offensive the photo showing a chicken being thrown to a number of lions. Apparently, "For amusement, customers pay \$3.60 to toss a live chicken to hungry lions. For a sheep the price jumps to \$36." This idea disturbs me, as does the fact that NATIONAL GEOGRAPHIC appears to condone such practices.

MOLLY SCHULMAN
Allston, Massachusetts

We, of course, do not condone the torture of animals for tourist fun. We do try, however, to portray an honest picture of life around the world, including images some would rather not see.

The idea of the wall being visible from space came from Western



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Blunt-nosed Leopard Lizard (*Gambelia sila*)
Size: Snout to vent length, 75-125 mm **Weight:** 20.5-37.5 g
Habitat: Arid areas and foothills of California's San Joaquin Valley
Surviving number: Unknown; populations declining



Photographed by Marc Moritsch

WILDLIFE AS CANON SEES IT

Hot-headed meets cold-blooded. Temperamentally, the blunt-nosed leopard lizard is not one to turn tail; when two males meet, they puff up their bodies and rap out a set of pushups in a bid at intimidation. When it comes to temperature, however, they are considerably more circumspect. They use their leopard-like spots to regulate body temperature—darker in the morning to absorb heat, the markings get lighter as the day

warms up—and hibernate through the chilly winter months. They emerge in the spring, ready to take on all comers. But they can't fight habitat loss, brought on by land development and resource extraction.

As an active, committed global corporation, we join worldwide efforts to promote awareness of endangered species. Just one way we are working to make the world a better place—today and tomorrow.

Digital Debate

I was disappointed to see the appearance of digitally manipulated photographs of dangling goats and invisible soldiers in the January issue. I am constantly impressed by your ability to capture amazing and unique images of the real world. I am not amazed or interested in your ability to use Photoshop. Unfortunately this type of image creates a skeptical eye in the reader of your magazine and lessens the impact of the real-world images. I am reminded of *Time* magazine's use of the darkened O. J. Simpson photo.

STEVE GALLUP
Moss Beach, California

As far as I am concerned, every photo is an artistic product, except photos that depict a

political event or any other factual theme. So artistic photography can use any alteration, but news photos must be kept unaltered.

GERARD VAN ROSSUM
Kloetinge, Netherlands
FROM OUR ONLINE FORUM
nationalgeographic.com/ngm/0301

You have a responsibility to describe the facts as they are and represent an accurate definition of their content, not a fictional portrayal of what could be. A grotesquely contrived image of goats suspended from the ceiling belongs more to Hollywood or the *National Enquirer*. This is not photojournalism. Although the caption indicates that the images were altered, telling someone you broke the law



CARY WOLINSKY, BARBARA EMMEL, DAVID DERANIAN

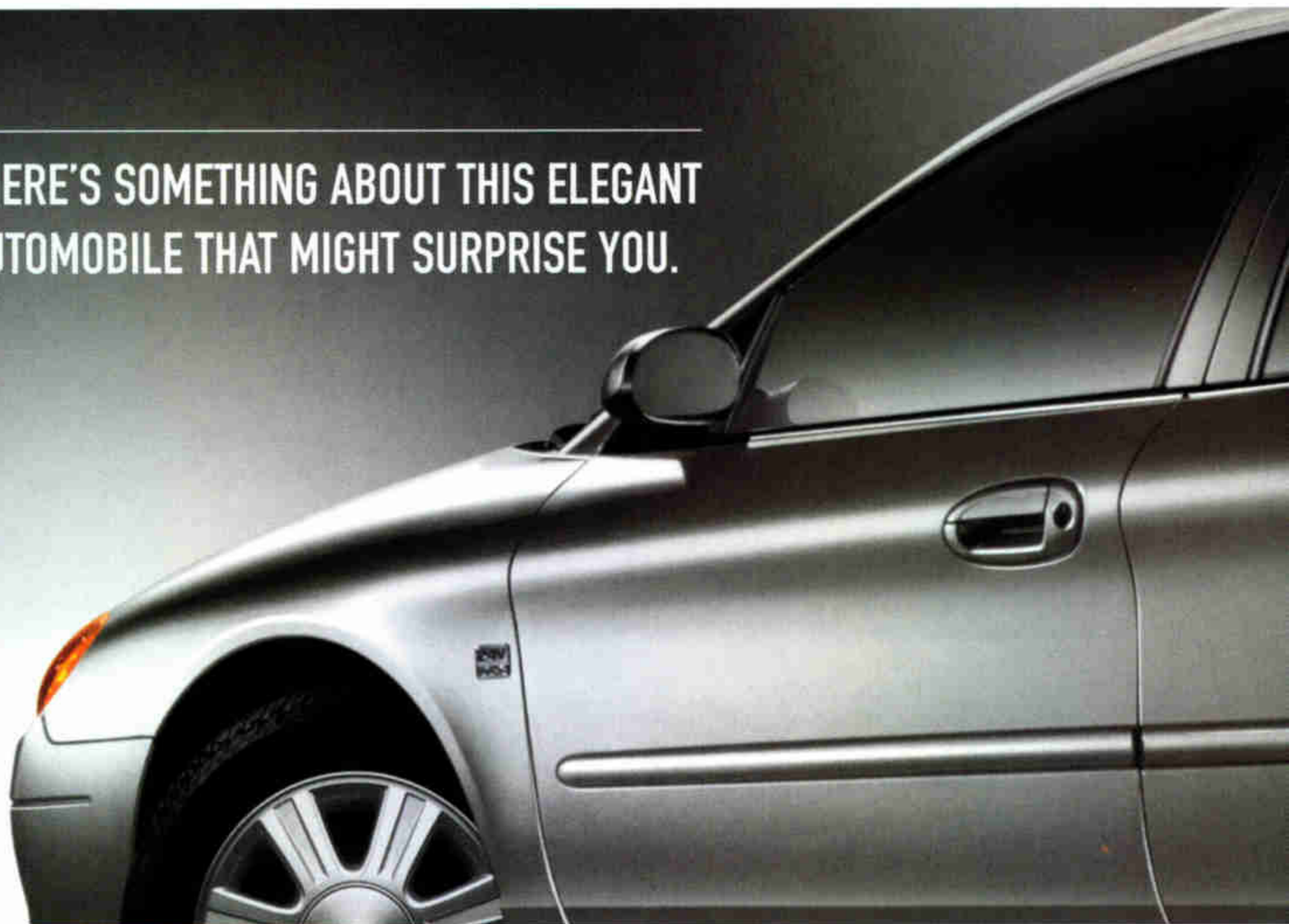
doesn't make you innocent.

PIERRE OBENDRAUF
Montreal, Quebec

Thank you for Bill Allen's refreshingly honest remarks [see January's From the Editor] warning us against confusing photographic fiction with reality. NATIONAL GEOGRAPHIC's refusal to alter the content of photos, together with its explanation of exceptions to this policy, goes a long way to establishing photographic validity in our current world of pictorial fantasy masquerading as reality.

LEO SHATIN
Boca Raton, Florida

THERE'S SOMETHING ABOUT THIS ELEGANT
AUTOMOBILE THAT MIGHT SURPRISE YOU.



writers, but the tradition is earlier than many suppose. English antiquarian William Stukeley stated in a letter in 1754 that Hadrian's Wall is exceeded in length only "by the Chinese wall, which makes a considerable figure upon the terrestrial globe, and may be discerned at the moon."

BILL GRIFFITHS
Wallsend, England

Peter Hessler's article mentions that the Ming's successors, the Qing, viewed the Great Wall as a failure and let the fortifications

WRITE TO FORUM

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deteriorate. Since the Qing were Manchus who had breached the walls to conquer the Ming, it's not surprising they doubted the military value of walls. In addition, as the Qing later controlled territory far to the north and west of the main Ming walls, it made little sense for them to maintain barriers located within their own borders.

PETER HANNAM AND CAO YIN
Tokyo, Japan

The article brought back fond memories of a person I met while doing a story about the wall for my *Los Angeles Times* column of February 10, 1984. At Badaling, 50 miles north of Beijing, I encountered a man singing at the top of his lungs in Chinese as he walked up the center of the 22-foot-high wall that snaked up a steep ridge. I

apologized and interrupted his singing. He spoke English. He said he was singing a song about the Great Wall. "What do the words say?" I asked. He replied, "I see China, and the Great Wall reminds me I am Chinese. I love my country. I am proud of my country. Now that I have climbed the Great Wall, I am a man." He was 26; a salesman from Hong Kong on his first visit to China. He had longed to be on the Great Wall all his life. "I lost my spirit of being Chinese," he said. "Today I have recaptured that spirit. For the first time in my life I feel I am finally Chinese."

CHARLES HILLINGER
Rancho Palos Verdes, California

Dreamweavers

While reading about all the possibilities for future textiles, I came across a mention of a GPS



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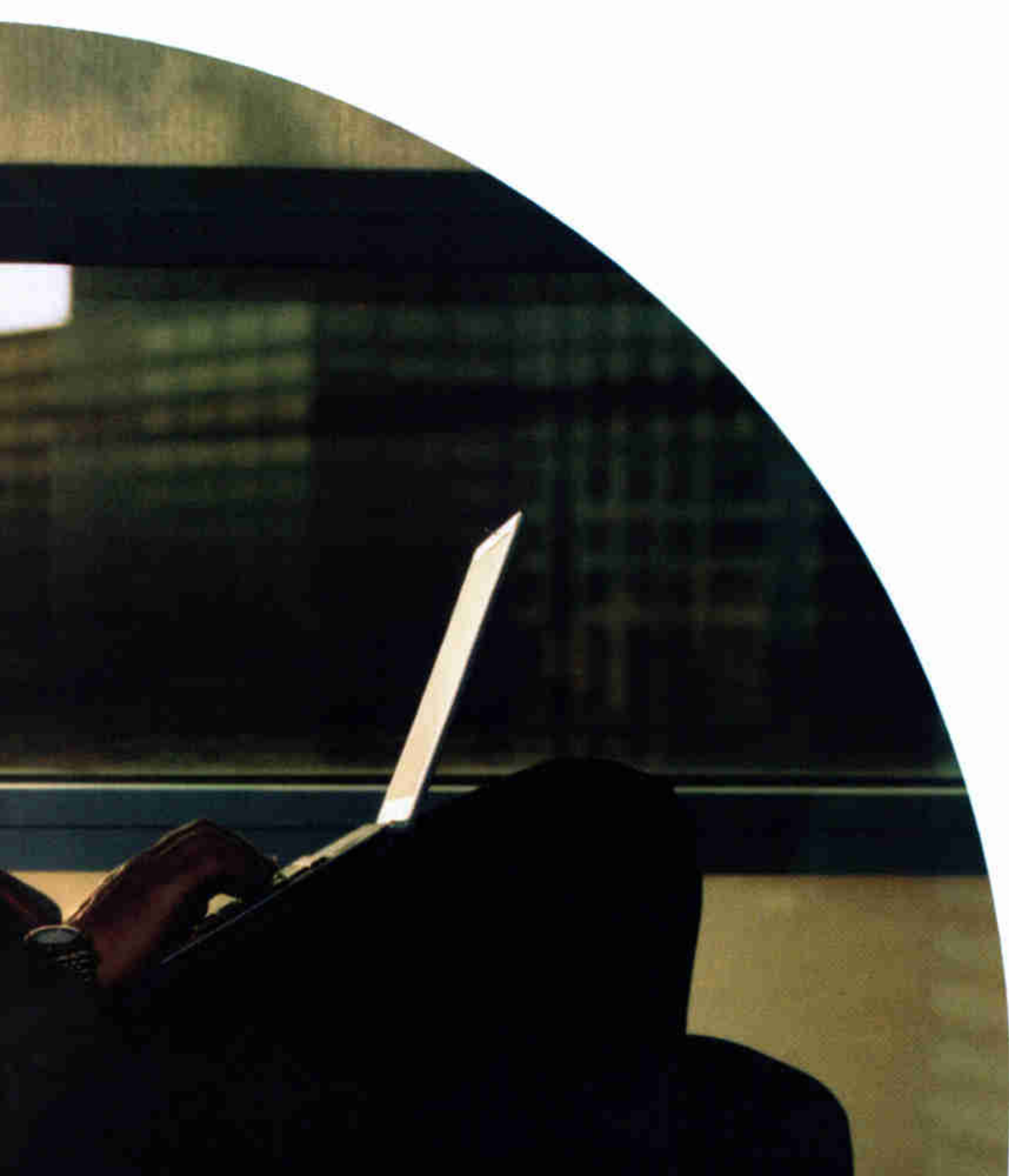


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(global positioning system) being embedded in clothing. Tracking devices in my shorts? If people feel tied down by technology already, wait until the jacket they are wearing can be tracked by their boss. No more sick days, baby.

DAVE GOSSELIN

Bloomfield Hills, Michigan

FROM OUR ONLINE FORUM

nationalgeographic.com/ngm/0301

I read about Alex Soza's floating jacket. The author reports that chemicals may be introduced into the jacket that will react to form helium. As the lightest noble gas, helium does not form any chemical compounds and thus cannot be produced from any normal chemical reaction. In the sun, hydrogen does combine to form helium through nuclear fusion. Perhaps Soza has stumbled onto a new form of cold fusion. Or are the chemicals reacting to form hydrogen? In that case, the wearer of the jacket could find himself in the midst of a miniature version of the *Hindenburg* disaster.

SAM FEBBA

Dimondale, Michigan

The floating jacket was actually filled with both helium and hydrogen. The experiment, carried out under strict safety precautions, was part of an artistic video production; no one was harmed in the making of the video.

I can only hope Jeff Turner's suggestion for a "space elevator," wherein a 200-mile-long spider-silk rope dangling from a satellite would be used to lift objects into space instead of a rocket, was a joke. A rope dangling from a satellite to a loading point on Earth would theoretically work only if it were from a satellite in geostationary orbit. That means it

would have to be positioned directly over the Equator (not a very convenient location for freight delivery), and the rope would have to be about 22,000 miles long, not 200.

LES KOPEL

Oxnard, California

Tracking devices in my shorts? If people feel tied down by technology already, wait until the jacket they are wearing can be tracked by their boss. No more sick days, baby.

I started in the textile business back in the mid-1970s and felt that I had a job for life. Then I watched the industry start a slow death march. I moved five times in as many years as plants lost business and closed. The collapse of the textile industry in the United States was mentioned only as a passing issue in the article. Although I understand that it was about technology and not economics, there were towns and people crushed by the migration of this industry.

JAMES DUFFY

Ramsey, New Jersey

I was aghast to read the remarks by biotech executive Jeff Turner. Asking himself why people are afraid of goats that produce spider-silk protein, he answered: "People fear newness; people fear change." Mr. Turner is

incorrect. People fear corporations altering ecosystems with GMOs (genetically modified organisms) rushed to the market for the sake of profits and payback on investments.

JEFF AKINS

Highland, New York

The new textiles described in this article are marvelous! But the dreams of their weavers saddened me. Imagine a lawn party where the dresses pick up the color and shape of the flowers in the garden, a nightclub where the dancers' clothes blend with the changing background. What joyful things to wear; what fun! The researchers want to design camouflage suits for soldiers fighting in city ruins. How pleasant it would be for everyone if these people thought of beauty before bullets, fashion before fighting, and wardrobes instead of warfare.

FRANK LUDWIG GROSSMANN

Peyrissac, France

Geographica


I read with interest "A Dump Reviled, Revered." One of the commodities that *wasn't* part of the 1.6 million tons of World Trade Center debris deposited in Fresh Kills landfill was over 200,000 tons of steel that has already been recycled into new products. We in the steel industry are proud to give new life to the steel from the World Trade Center. Some of the steel is being examined for use in a U.S. Navy ship to be named the *New York*.

BILL HEENAN

President, Steel Recycling Institute

Pittsburgh, Pennsylvania

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Please read the important Product Information about NEXIUM on the following page and discuss it with your doctor.

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Nexium[®]
(esomeprazole magnesium)

Please read this summary carefully, and then ask your doctor about NEXIUM.

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Nexium[®] (esomeprazole magnesium) 20-MG, 40-MG Delayed-Release Capsules

BRIEF SUMMARY Before prescribing NEXIUM, please see full Prescribing Information.

INDICATIONS AND USAGE NEXIUM is indicated for the short-term treatment (4 to 8 weeks) in the healing and symptomatic resolution of diagnostically confirmed erosive esophagitis.

CONTRAINDICATIONS NEXIUM is contraindicated in patients with known hypersensitivity to any component of the formulation or to substituted benzimidazoles.

PRECAUTIONS Symptomatic response to therapy with NEXIUM does not preclude the presence of gastric malignancy. Atrophic gastritis has been noted occasionally in gastric corpus biopsies from patients treated long-term with omeprazole, of which NEXIUM is an enantiomer.

Information for Patients: NEXIUM Delayed-Release Capsules should be taken at least one hour before meals. For patients who have difficulty swallowing capsules, one tablespoon of applesauce can be added to an empty bowl and the NEXIUM Delayed-Release Capsule opened, and the pellets carefully emptied onto the applesauce. The pellets should be mixed with the applesauce and then swallowed immediately. The applesauce used should not be hot and should be soft enough to be swallowed without chewing. The pellets should not be chewed or crushed. The pellet/applesauce mixture should not be stored for future use. Antacids may be used while taking NEXIUM.

Drug Interactions: Esomeprazole is extensively metabolized in the liver by CYP2C19 and CYP3A4.

In vitro and *in vivo* studies have shown that esomeprazole is not likely to inhibit CYPs 1A2, 2A6, 2C9, 2D6, 2E1 and 3A4. No clinically relevant interactions with drugs metabolized by these CYP enzymes would be expected. Drug interaction studies have shown that esomeprazole does not have any clinically significant interactions with phenytoin, warfarin, quinidine, clarithromycin or amoxicillin. Esomeprazole may potentially interfere with CYP2C19, the major esomeprazole metabolizing enzyme. Coadministration of esomeprazole 30 mg and diazepam, a CYP2C19 substrate, resulted in a 45% decrease in clearance of diazepam. Increased plasma levels of diazepam were observed 12 hours after dosing and onwards. However, at that time, the plasma levels of diazepam were below the therapeutic interval, and thus this interaction is unlikely to be of clinical relevance. Esomeprazole inhibits gastric acid secretion. Therefore, esomeprazole may interfere with the absorption of drugs where gastric pH is an important determinant of bioavailability (eg, ketoconazole, iron salts and digoxin). Coadministration of oral contraceptives, diazepam, phenytoin, or quinidine did not seem to change the pharmacokinetic profile of esomeprazole.

Carcinogenesis, Mutagenesis, Impairment of Fertility: The carcinogenic potential of esomeprazole was assessed using omeprazole studies.

In two 24-month oral carcinogenicity studies in rats, omeprazole at daily doses of 1.7, 3.4, 13.8, 44.0 and 140.8 mg/kg/day (about 0.7 to 57 times the human dose of 20 mg/day expressed on a body surface area basis) produced gastric ECL cell carcinoids in a dose-related manner in both male and female rats; the incidence of this effect was markedly higher in female rats, which had higher blood levels of omeprazole. Gastric carcinoids seldom occur in the untreated rat. In addition, ECL cell hyperplasia was present in all treated groups of both sexes. In one of these studies, female rats were treated with 13.8 mg omeprazole/kg/day (about 5.6 times the human dose on a body surface area basis) for 1 year, then followed for an additional year without the drug. No carcinoids were seen in these rats. An increased incidence of treatment-related ECL cell hyperplasia was observed at the end of 1 year (94% treated vs 10% controls). By the second year the difference between treated and control rats was much smaller (46% vs 26%) but still showed more hyperplasia in the treated group. Gastric adenocarcinoma was seen in one rat (2%). No similar tumor was seen in male or female rats treated for 2 years. For this strain of rat no similar tumor has been noted historically, but a finding involving only one tumor is difficult to interpret. A 78-week mouse carcinogenicity study of omeprazole did not show increased tumor occurrence, but the study was not conclusive. Esomeprazole was negative in the Ames mutation test, in the *in vivo* rat bone marrow cell chromosome aberration test, and the *in vivo* mouse micronucleus test. Esomeprazole, however, was positive in the *in vitro* human lymphocyte chromosome aberration test. Omeprazole was positive in the *in vitro* human lymphocyte chromosome aberration test, the *in vivo* mouse bone marrow cell chromosome aberration test, and the *in vivo* mouse micronucleus test. The potential effects of esomeprazole on fertility and reproductive performance were assessed using omeprazole studies. Omeprazole at oral doses up to 138 mg/kg/day in rats (about 56 times the human dose on a body surface area basis) was found to have no effect on reproductive performance of parental animals.

Pregnancy: Teratogenic Effects. Pregnancy Category B—Teratology studies have been performed in rats at oral doses up to 280 mg/kg/day (about 57 times the human dose on a body surface area basis) and in rabbits at oral doses up to 86 mg/kg/day (about 35 times the human dose on a body surface area basis) and have revealed no evidence of impaired fertility or harm to the fetus due to esomeprazole. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed. Teratology studies conducted with omeprazole in rats at oral doses up to 138 mg/kg/day (about 56 times the human dose on a body surface area basis) and in rabbits at doses up to 69 mg/kg/day (about 56 times the human dose on a body surface area basis) did not disclose any evidence for a teratogenic potential of omeprazole. In rabbits, omeprazole in a dose range of 6.9 to 69.1 mg/kg/day (about 5.5 to 56 times the human dose on a body surface area basis) produced dose-related increases in embryolethality, fetal resorptions, and pregnancy disruptions. In rats, dose-related embryo/fetal toxicity and postnatal developmental toxicity were observed in offspring resulting from parents treated with omeprazole at 13.8 to 138.0 mg/kg/day (about 5.6 to 56 times the human doses on a body surface area basis). There are no adequate and well-controlled

studies in pregnant women. Sporadic reports have been received of congenital abnormalities occurring in infants born to women who have received omeprazole during pregnancy.

Nursing Mothers: The excretion of esomeprazole in milk has not been studied. However, omeprazole concentrations have been measured in breast milk of a woman following oral administration of 20 mg. Because esomeprazole is likely to be excreted in human milk, because of the potential for serious adverse reactions in nursing infants from esomeprazole, and because of the potential for tumorigenicity shown for omeprazole in rat carcinogenicity studies, a decision should be made whether to discontinue nursing or to discontinue the drug, taking into account the importance of the drug to the mother.

Pediatric Use: Safety and effectiveness in pediatric patients have not been established.

Geriatric Use: Of the total number of patients who received NEXIUM in clinical trials, 778 were 65 to 74 years of age and 124 patients were \geq 75 years of age. No overall differences in safety and efficacy were observed between the elderly and younger individuals, and other reported clinical experience has not identified differences in responses between the elderly and younger patients, but greater sensitivity of some older individuals cannot be ruled out.

ADVERSE REACTIONS The safety of NEXIUM was evaluated in over 10,000 patients (aged 18-84 years) in clinical trials worldwide including over 7,400 patients in the United States and over 2,600 patients in Europe and Canada. Over 2,900 patients were treated in long-term studies for up to 6-12 months. In general, NEXIUM was well tolerated in both short- and long-term clinical trials. The safety in the treatment of healing of erosive esophagitis was assessed in four randomized comparative clinical trials, which included 1,240 patients on NEXIUM 20 mg, 2,434 patients on NEXIUM 40 mg, and 3,008 patients on omeprazole 20 mg daily. The most frequently occurring adverse events (\geq 1%) in all three groups was headache (5.5, 5.0, and 3.8, respectively) and diarrhea (no difference among the three groups). Nausea, flatulence, abdominal pain, constipation, and dry mouth occurred at similar rates among patients taking NEXIUM or omeprazole. Additional adverse events that were reported as possibly or probably related to NEXIUM with an incidence $<$ 1% are listed below by body system:

Body as a Whole: abdomen enlarged, allergic reaction, asthenia, back pain, chest pain, chest pain substernal, facial edema, peripheral edema, hot flushes, fatigue, fever, flu-like disorder, generalized edema, leg edema, malaise, pain, rigors;

Cardiovascular: flushing, hypertension, tachycardia; **Endocrine:** goiter; **Gastrointestinal:** bowel irregularity, constipation aggravated, dyspepsia, dysphagia, dysplasia GI, epigastric pain, eructation, esophageal disorder, frequent stools, gastroenteritis, GI hemorrhage, GI symptoms not otherwise specified, hiccup, melena, mouth disorder, pharynx disorder, rectal disorder, serum gastrin increased, tongue disorder, tongue edema, ulcerative stomatitis, vomiting;

Hearing: earache, tinnitus; **Hematologic:** anemia, anemia hypochromic, cervical lymphadenopathy, epistaxis, leukocytosis, leukopenia, thrombocytopenia; **Hepatic:** bilirubinemia, hepatic function abnormal, SGOT increased, SGPT increased; **Metabolic/Nutritional:** glycosuria, hyperuricemia, hyponatremia, increased alkaline phosphatase, thirst, vitamin B12 deficiency, weight increase, weight decrease; **Musculoskeletal:** arthralgia, arthritis aggravated, arthropathy, cramps, fibromyalgia syndrome, hernia, polymyalgia rheumatica; **Nervous System/Psychiatric:** anorexia, apathy, appetite increased, confusion, depression aggravated, dizziness, hypertonia, nervousness, hypoesthesia, impotence, insomnia, migraine, migraine aggravated, paresthesia, sleep disorder, somnolence, tremor, vertigo, visual field defect; **Reproductive:** dysmenorrhea, menstrual disorder, vaginitis; **Respiratory:** asthma aggravated, coughing, dyspnea, larynx edema, pharyngitis, rhinitis, sinusitis; **Skin and Appendages:** acne, angioedema, dermatitis, pruritus, pruritus ani, rash, rash erythematous, rash maculo-papular, skin inflammation, sweating increased, urticaria; **Special Senses:** otitis media, parosmia, taste loss, taste perversion; **Urogenital:** abnormal urine, albuminuria, cystitis, dysuria, fungal infection, hematuria, micturition frequency, moniliasis, genital moniliasis, polyuria; **Visual:** conjunctivitis, vision abnormal.


Endoscopic findings that were reported as adverse events include: duodenitis, esophagitis, esophageal stricture, esophageal ulceration, esophageal varices, gastric ulcer, gastritis, hernia, benign polyps or nodules, Barrett's esophagus, and mucosal discoloration.

Postmarketing Reports—There have been spontaneous reports of adverse events with post-marketing use of esomeprazole. These reports have included rare cases of anaphylactic reaction. Other adverse events not observed with NEXIUM, but occurring with omeprazole can be found in the omeprazole package insert, **ADVERSE REACTIONS** section.

OVERDOSAGE A single oral dose of esomeprazole at 510 mg/kg (about 103 times the human dose on a body surface area basis), was lethal to rats. The major signs of acute toxicity were reduced motor activity, changes in respiratory frequency, tremor, ataxia, and intermittent clonic convulsions. There have been no reports of overdose with esomeprazole. Reports have been received of overdosage with omeprazole in humans. Doses ranged up to 2,400 mg (120 times the usual recommended clinical dose). Manifestations were variable, but included confusion, drowsiness, blurred vision, tachycardia, nausea, diaphoresis, flushing, headache, dry mouth, and other adverse reactions similar to those seen in normal clinical experience (see omeprazole package insert-**ADVERSE REACTIONS**). No specific antidote for esomeprazole is known. Since esomeprazole is extensively protein bound, it is not expected to be removed by dialysis. In the event of overdosage, treatment should be symptomatic and supportive. As with the management of any overdose, the possibility of multiple drug ingestion should be considered. For current information on treatment of any drug overdose, a certified Regional Poison Control Center should be contacted. Telephone numbers are listed in the Physicians' Desk Reference (PDR) or local telephone book.

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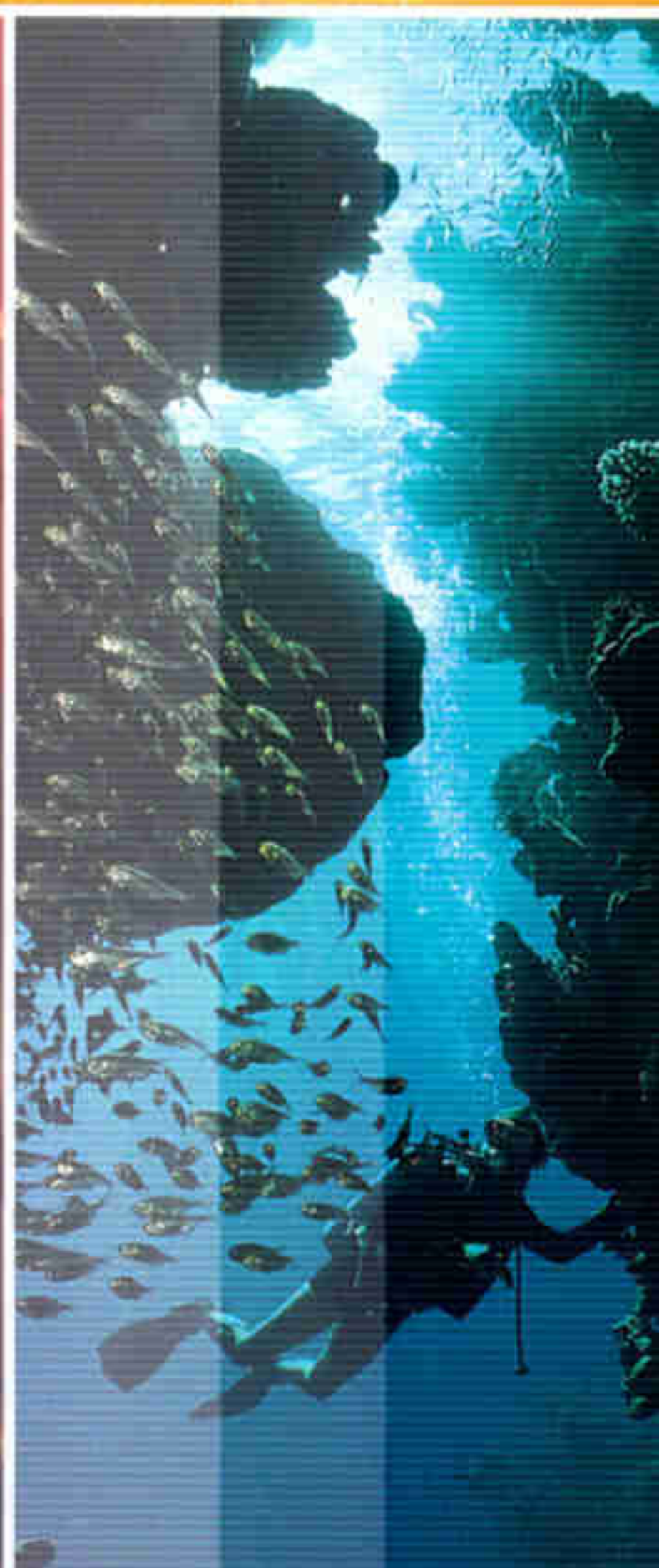
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PALEONTOLOGY

Lord of the Wings

Feathery fossil gives mixed signals about early flight



XU XING. ART BY JOHN SIBBICK

It's been nearly a century since the Wright Flyer lifted off from the sands of Kitty Hawk. For years many scientists thought that the first birds to fly took to the air the same way—from the ground up, with a running start. But the recent find in China of a primitive dinosaurian relative of birds called *Microraptor gui* (above), complete with feathers forming wings on all four of its limbs, seems to blur the picture. Living 120 to 110 million years ago, the crow-size animal looks like it might have flown by gliding from tree to tree.

Many scientists think dromaeosaurs, a group of dinosaurs

closely related to today's birds, were living on the ground when they evolved almost all the anatomy needed for flapping their arms. Eventually this arm flapping might have led to a takeoff from a run or a jump.

But the Chinese team that studied *M. gui*, led by Xu Xing and Zhou Zhonghe of the Institute of Vertebrate Paleontology and Paleoanthropology, doesn't think this animal ran or flapped well enough to take off. Its leg feathers would've tripped it up like a hurdler in a ball gown. Instead, the ample feathers could have formed an airfoil or parachute similar to those of flying squirrels and other tree-dwelling

gliders, the scientists say.

Adding in the fact that *M. gui* came early in the evolution of dromaeosaurs led them to hypothesize that gliding may have played an important role in the initial stages of the development of avian flight. They speculate that gliding from trees gave bird ancestors a chance to practice powered flight, using the forelimb flapping they began to develop on the ground.

AFRICA

C R E A T U R E S O F O U R U N I V E R S E



Other scientists aren't sure what to make of the new fossil, arguing that gliding doesn't necessarily evolve into powered flight: Why waste energy beating your wings when you could take it easy? And how, they wonder, could *M. gui* have assumed the spread-eagle posture gliding requires? Dinosaurs normally carried their legs under their bodies; they couldn't move them out to the sides. Some researchers suggest that *M. gui*'s leg feathers weren't useful for flight at all. They might instead have played a role in sexual display, or perhaps to make a tiny dinosaur look bigger.

—Christopher P. Sloan

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LIRIO DA FONSECA, REUTERS

EAST TIMOR

A Babel of Birthday Wishes

The world's newest nation seeks a voice of its own

How do you sing happy birthday to a tiny Asian country that after roughly 450 years of foreign domination finally declares its independence? Preferably, in more than one language. The people of East Timor (now officially Timor-Leste), who on May 20th celebrate their first year of independence from Indonesia, have struggled to sort out their linguistic differences as they rebuild the infrastructure of their fledgling democracy.

Located just north of Australia, the island of Timor has long served as a colonial outpost, with its eastern half under Portuguese sway for most years from the

1550s to 1975. (Timor's western half has been part of Indonesia since 1949.) When the Portuguese withdrew from East Timor in 1975, Indonesia, fearing a Marxist regime would take root next door, invaded almost immediately. Its brutal occupation ended in 1999, when the United Nations intervened to shepherd East Timor to freedom.

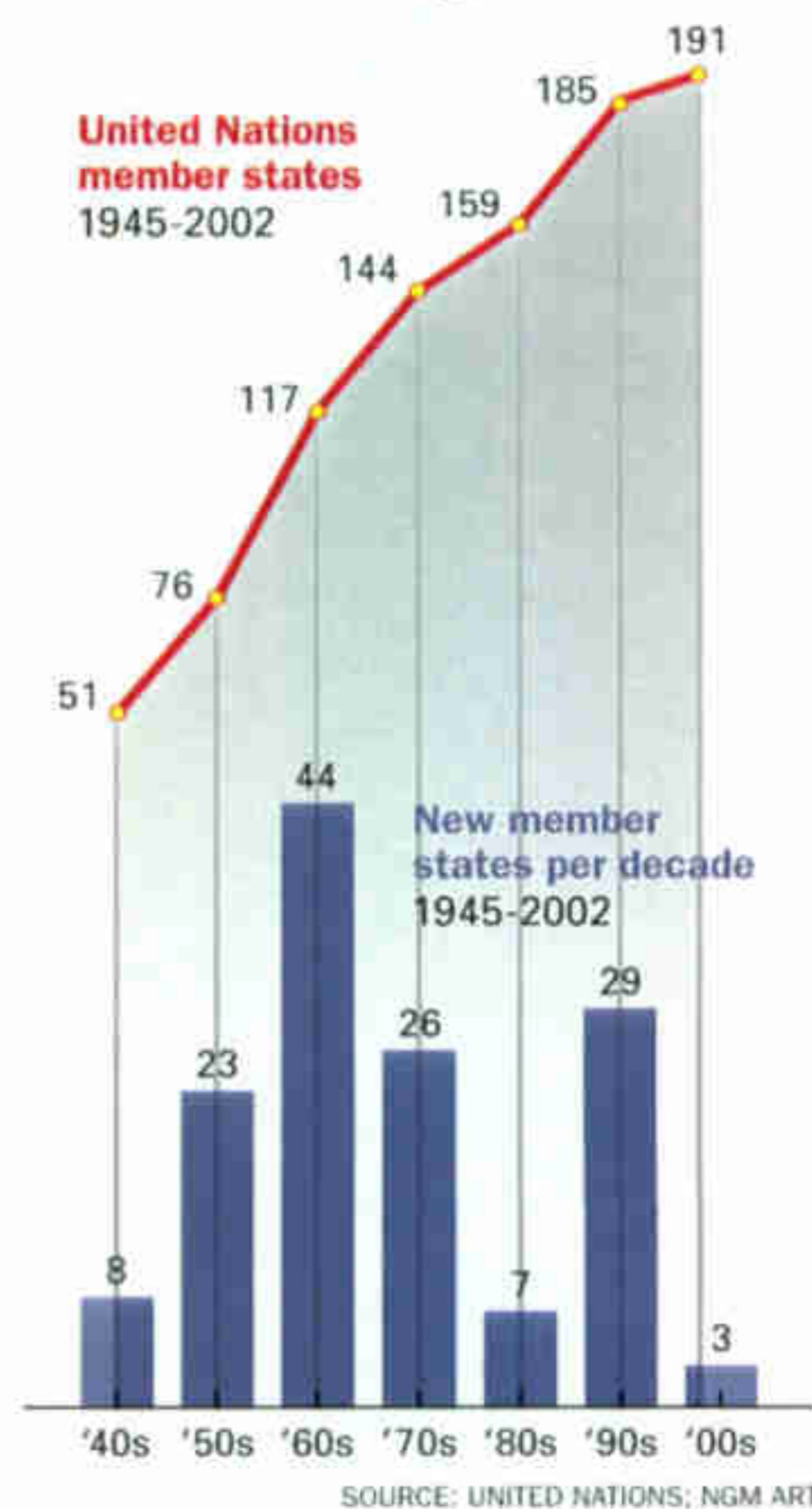
Year one had its bright spots. Thousands of refugees came home from the island's western side. Soldiers of the newly minted East Timor Defense Force began replacing UN peacekeepers. The linchpins of democracy, such as courts and a legislature, began functioning. But 42 percent of the population still lives in poverty, unemployment exceeds 50 percent, and the nation's maze of languages remains a hindrance to development. Bahasa

Indonesia, spoken by most people under 25 years old, carries grim echoes of the recent occupation. Tetum,

one of East Timor's two official languages, is widely spoken locally but useless in the global marketplace—which is why the country's ruling elite favors the other official language, Portuguese. Instead of singing happy birthday, it might be better just to hum it.

—Alan Mairson

Nation Building



Since the UN was founded in 1945, its membership has grown steadily but fitfully. Its two biggest growth spurts: the early 1960s, after more than two dozen African nations declared their independence, and the early 1990s, when the Soviet Union and Yugoslavia broke apart. Today the UN has 191 members, including its newest ones—East Timor and venerable Switzerland, which finally joined a UN no longer riven by dueling superpowers.

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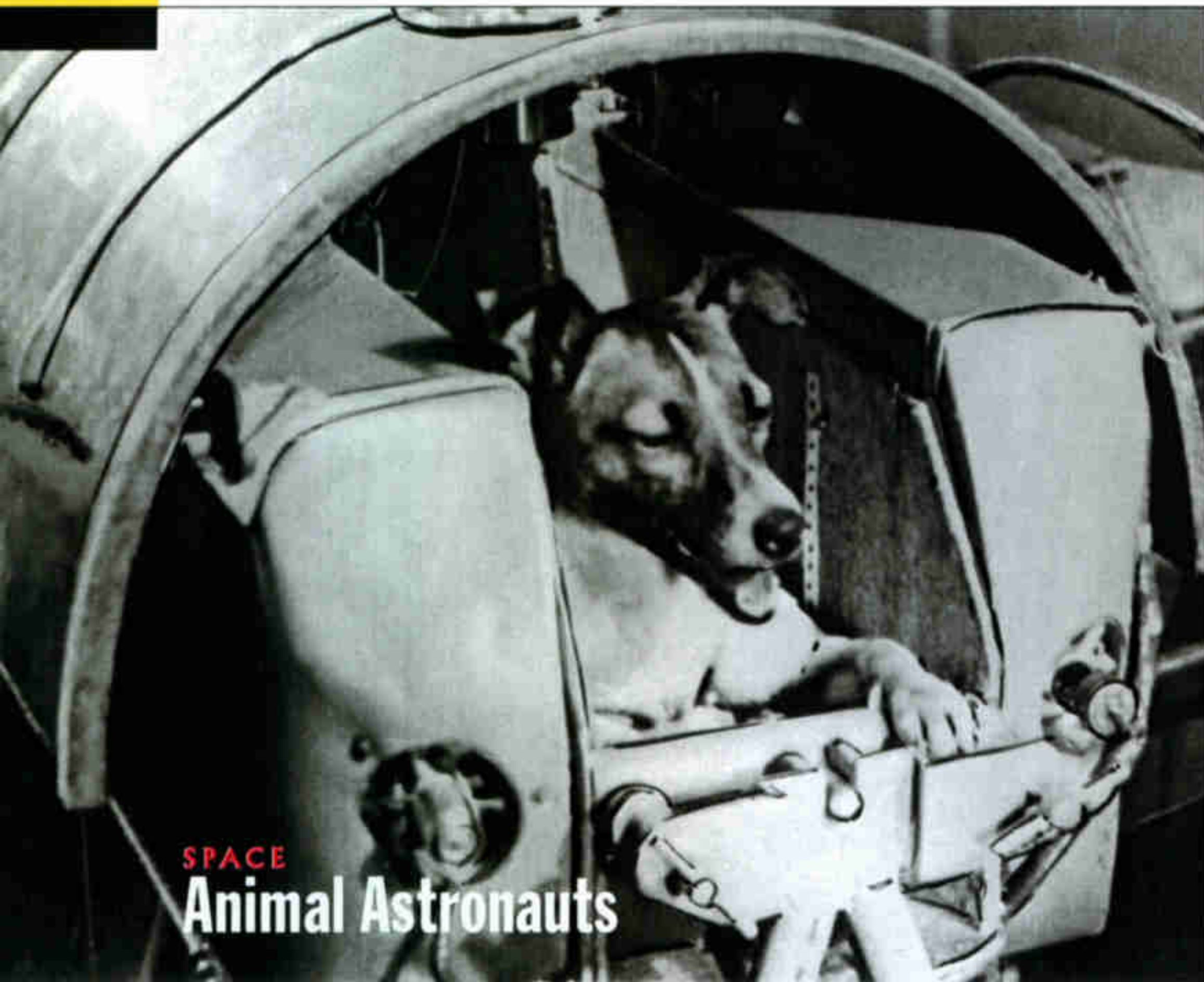
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SPACE
Animal Astronauts

BETTMANN/CORBIS



MARSHALL SFC, NASA

1959 Baker the squirrel monkey (left) survived a ballistic rocket flight.

1961 Months before the first human flights, the chimp Ham (right) survived a test run into space.

1960 First successful try to put animals in orbit and have them reenter the atmosphere alive.



JOHNSON SPACE CENTER, NASA

1966 Soviet dogs set canine space-flight record: 22 days in orbit (unsurpassed by humans until 1974).



MARSHALL SFC, NASA

1973 Can spiders spin webs in zero g? Arabella the orb weaver (left), star of a high schooler's space experiment, answered yes, though only with practice.

1986 The first manned animal lab in space used rats (right) as subjects. Hundreds have been on the shuttle since.



AMES RESEARCH CENTER, NASA

1998 More than 200 swordtail fish (left) went up on the shuttle; they showed disorientation in zero g, swimming loop-the-loops.



KENNEDY SPACE CENTER, NASA

The fallen heroes of the space shuttle *Columbia* had company on their fateful ride: rats, spiders, bees, fish, and other creatures aboard as subjects of scientific research. Previous high-altitude animal studies have provided insights into the effects of space travel and even data toward a new osteoporosis drug. But the going's been tough since the first "flight" in 1783, when a sheep, a rooster, and a duck rose 1,500 feet over France in a hot-air balloon. A Russian mongrel, Laika (above), reached orbit in 1957, but suffocated when her oxygen ran out. Thirteen dogs and a handful of monkeys died before scientists got it right. Even basic care has been a challenge. Feeding animals in zero g is tough, "and you can't train rats to use a toilet," says NASA's Paul Callahan. So why bother? Without gravity, muscle and bone deteriorate and hormones malfunction, making animal astronauts ideal subjects for studying aging and illness from anemia to cancer.

—Jennifer Steinberg Holland

LAST CALL

A Secret Script, for Women Only

For centuries they were forbidden to read or write, so women in China's Jiangyong county came up with their own cryptic writing system known only to themselves. Living under the strict control of men—often in arranged and abusive marriages—they created Nu Shu, meaning "female writing," as a way to communicate and help each other cope using poems, stories, and songs, sometimes sewn into textiles (below). The characters are based on traditional Chinese, but altered to make new meanings and written in a wispy, graceful slant. The vocabulary was taken from the local dialect. Today only a handful of women read and write Nu Shu, but the Chinese government has promised funds for a museum and dictionary to preserve the script. —Marisa J. Larson

Image Not Available

FRITZ HOFFMAN, DOCUMENT CHINA



***There's a new and different way
to treat seasonal allergies.***

SINGULAIR IS THE ONLY SEASONAL ALLERGY MEDICATION THAT SPECIFICALLY BLOCKS LEUKOTRIENES. Many existing allergy medicines block histamine. SINGULAIR is different. It works by blocking leukotrienes (loo-koh-TRY-eens). Leukotrienes are an underlying cause of allergy symptoms. They are substances produced in your body that can make you feel uncomfortable during allergy season.

HELPS RELIEVE A BROAD RANGE OF SYMPTOMS. A single SINGULAIR tablet a day helps relieve a broad range of seasonal allergy symptoms for a full 24 hours. SINGULAIR is also available in a cherry chewable tablet for children 2 to 14 years of age. SINGULAIR should be taken once a day, as prescribed. SINGULAIR is available by prescription only.

IMPORTANT INFORMATION: In clinical studies, side effects were usually mild and varied by age, and included headache, ear infection, sore throat, and upper respiratory infection. Side effects generally did not stop patients from taking SINGULAIR. SINGULAIR should not be taken by people who are sensitive to any of its ingredients.

Ask your doctor about SINGULAIR for your seasonal allergies.
Call 1-888-MERCK-95, or visit singulair.com.

Please see the Patient Product Information on the adjacent page and discuss it with your doctor.



This product is available through the Merck Patient Assistance Program. To find out if you qualify call 1-888-MERCK-56.

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9094214

Patient Information
SINGULAIR® (SING-u-lair) Tablets, Chewable Tablets, and Oral Granules
Generic name: montelukast (mon-te-LOO-kast) sodium

Read this information before you start taking SINGULAIR®. Also, read the leaflet you get each time you refill SINGULAIR, since there may be new information in the leaflet since the last time you saw it. This leaflet does not take the place of talking with your doctor about your medical condition and/or your treatment.

What is SINGULAIR*?

- SINGULAIR is a medicine called a leukotriene receptor antagonist. It works by blocking substances in the body called leukotrienes. Blocking leukotrienes improves asthma and seasonal allergic rhinitis (also known as hay fever). SINGULAIR is not a steroid.

SINGULAIR is prescribed for the treatment of asthma and seasonal allergic rhinitis:

1. Asthma.

SINGULAIR should be used for the long-term management of asthma in adults and children ages 12 months and older.

Do not take SINGULAIR for the immediate relief of an asthma attack. If you get an asthma attack, you should follow the instructions your doctor gave you for treating asthma attacks. (See the end of this leaflet for more information about asthma.)

2. Seasonal Allergic Rhinitis.

SINGULAIR is used to help control the symptoms of seasonal allergic rhinitis (sneezing, stuffy nose, runny nose, itching of the nose) in adults and children ages 2 years and older. (See the end of this leaflet for more information about seasonal allergic rhinitis.)

Who should not take SINGULAIR?

Do not take SINGULAIR if you are allergic to SINGULAIR or any of its ingredients.

The active ingredient in SINGULAIR is montelukast sodium.

See the end of this leaflet for a list of all the ingredients in SINGULAIR.

What should I tell my doctor before I start taking SINGULAIR?

Tell your doctor about:

- **Pregnancy:** If you are pregnant or plan to become pregnant. SINGULAIR may not be right for you.
- **Breast-feeding:** If you are breast-feeding, SINGULAIR may be passed in your milk to your baby. You should consult your doctor before taking SINGULAIR if you are breast-feeding or intend to breast-feed.
- **Medical Problems or Allergies:** Talk about any medical problems or allergies you have now or had in the past.
- **Other Medicines:** Tell your doctor about all the medicines you take, including prescription and non-prescription medicines, and herbal supplements. Some medicines may affect how SINGULAIR works, or SINGULAIR may affect how your other medicines work.

How should I take SINGULAIR?

For adults or children 12 months and older with asthma:

- Take SINGULAIR once a day in the evening.
- Take SINGULAIR every day for as long as your doctor prescribes it, even if you have no asthma symptoms.
- You may take SINGULAIR with food or without food.
- If your asthma symptoms get worse, or if you need to increase the use of your inhaled rescue medicine for asthma attacks, *call your doctor right away*.
- **Do not take SINGULAIR for the immediate relief of an asthma attack.** If you get an asthma attack, you should follow the instructions your doctor gave you for treating asthma attacks.
- Always have your inhaled rescue medicine for asthma attacks with you.
- Do not stop taking or lower the dose of your other asthma medicines unless your doctor tells you to.
- If your doctor has prescribed a medicine for you to use before exercise, keep using that medicine unless your doctor tells you not to.

For adults and children 2 years of age and older with seasonal allergic rhinitis:

- Take SINGULAIR once a day, at about the same time each day.

- Take SINGULAIR every day for as long as your doctor prescribes it.
- You may take SINGULAIR with food or without food.

How should I give SINGULAIR oral granules to my child?

Do not open the packet until ready to use.

SINGULAIR 4-mg oral granules can be given either:

- directly in the mouth;
- OR
- mixed with a spoonful of one of the following soft foods at cold or room temperature: apple-sauce, mashed carrots, rice, or ice cream. Be sure that the entire dose is mixed with the food and that the child is given the entire spoonful of the mixture right away (within 15 minutes).

IMPORTANT: Never store any oral granule/food mixture for use at a later time. Throw away any unused portion.

Do not put SINGULAIR oral granules in liquid drink. However, your child may drink liquids after swallowing the SINGULAIR oral granules.

What is the daily dose of SINGULAIR for asthma or seasonal allergic rhinitis?

For Asthma (Take in the evening):

- One 10-mg tablet for adults and adolescents 15 years of age and older,
- One 5-mg chewable tablet for children 6 to 14 years of age,
- One 4-mg chewable tablet or one packet of 4-mg oral granules for children 2 to 5 years of age, or
- One packet of 4-mg oral granules for children 12 to 23 months of age.

For Seasonal Allergic Rhinitis (Take at about the same time each day):

- One 10-mg tablet for adults and adolescents 15 years of age and older,
- One 5-mg chewable tablet for children 6 to 14 years of age, or
- One 4-mg chewable tablet or one packet of 4-mg oral granules for children 2 to 5 years of age.

What should I avoid while taking SINGULAIR?

If you have asthma and if your asthma is made worse by aspirin, continue to avoid aspirin or other medicines called non-steroidal anti-inflammatory drugs while taking SINGULAIR.

What are the possible side effects of SINGULAIR?

The side effects of SINGULAIR are usually mild, and generally did not cause patients to stop taking their medicine. The side effects in patients treated with SINGULAIR were similar in type and frequency to side effects in patients who were given a placebo (a pill containing no medicine).

The most common side effects with SINGULAIR include:

- stomach pain
- stomach or intestinal upset
- heartburn
- tiredness
- fever
- stuffy nose
- cough
- flu
- upper respiratory infection
- dizziness
- headache
- rash

Less common side effects that have happened with SINGULAIR include (listed alphabetically):

agitation including aggressive behavior, allergic reactions (including swelling of the face, lips, tongue, and/or throat, which may cause trouble breathing or swallowing), hives, and itching, bad/vivid dreams, increased bleeding tendency, bruising, diarrhea, hallucinations (seeing things that are not there), indigestion, inflammation of the pancreas, irritability, joint pain, muscle aches and muscle cramps, nausea, palpitations, restlessness, seizures (convulsions or fits), swelling, trouble sleeping, and vomiting.

Rarely, asthmatic patients taking SINGULAIR have experienced a condition that includes certain symptoms

that do not go away or that get worse. These occur usually, but not always, in patients who were taking steroid pills by mouth for asthma and those steroids were being slowly lowered or stopped. Although SINGULAIR has not been shown to cause this condition, **you must tell your doctor right away if you get one or more of these symptoms:**

- a feeling of pins and needles or numbness of arms or legs
- a flu-like illness
- rash
- severe inflammation (pain and swelling) of the sinuses (sinusitis)

These are not all the possible side effects of SINGULAIR. For more information ask your doctor or pharmacist.

Talk to your doctor if you think you have side effects from taking SINGULAIR.

General Information about the safe and effective use of SINGULAIR

Medicines are sometimes prescribed for conditions that are not mentioned in patient information leaflets. Do not use SINGULAIR for a condition for which it was not prescribed. Do not give SINGULAIR to other people even if they have the same symptoms you have. It may harm them. **Keep SINGULAIR and all medicines out of the reach of children.**

Store SINGULAIR at 25°C (77°F). Protect from moisture and light. Store in original package.

This leaflet summarizes information about SINGULAIR. If you would like more information, talk to your doctor. You can ask your pharmacist or doctor for information about SINGULAIR that is written for health professionals.

What are the ingredients in SINGULAIR?

Active Ingredient: montelukast sodium

SINGULAIR chewable tablets contain aspartame, a source of phenylalanine.

Phenylketonurics: SINGULAIR 4-mg and 5-mg chewable tablets contain 0.674 and 0.842 mg phenylalanine, respectively.

Inactive ingredients:

- **4-mg oral granules:** mannitol, hydroxypropyl cellulose, and magnesium stearate.
- **4-mg and 5-mg chewable tablets:** mannitol, microcrystalline cellulose, hydroxypropyl cellulose, red ferric oxide, croscarmellose sodium, cherry flavor, aspartame, and magnesium stearate.
- **10-mg tablet:** microcrystalline cellulose, lactose monohydrate, croscarmellose sodium, hydroxypropyl cellulose, magnesium stearate, hydroxypropyl methylcellulose, titanium dioxide, red ferric oxide, yellow ferric oxide, and carnauba wax.

What is asthma?

Asthma is a continuing (chronic) inflammation of the bronchial passageways which are the tubes that carry air from outside the body to the lungs.

Symptoms of asthma include:

- coughing
- wheezing
- chest tightness
- shortness of breath

What is seasonal allergic rhinitis?

- Seasonal allergic rhinitis, also known as hay fever, is an allergic response caused by pollens from trees, grasses and weeds.
- Symptoms of seasonal allergic rhinitis may include:
 - stuffy, runny, and/or itchy nose.
 - sneezing

Rx Only

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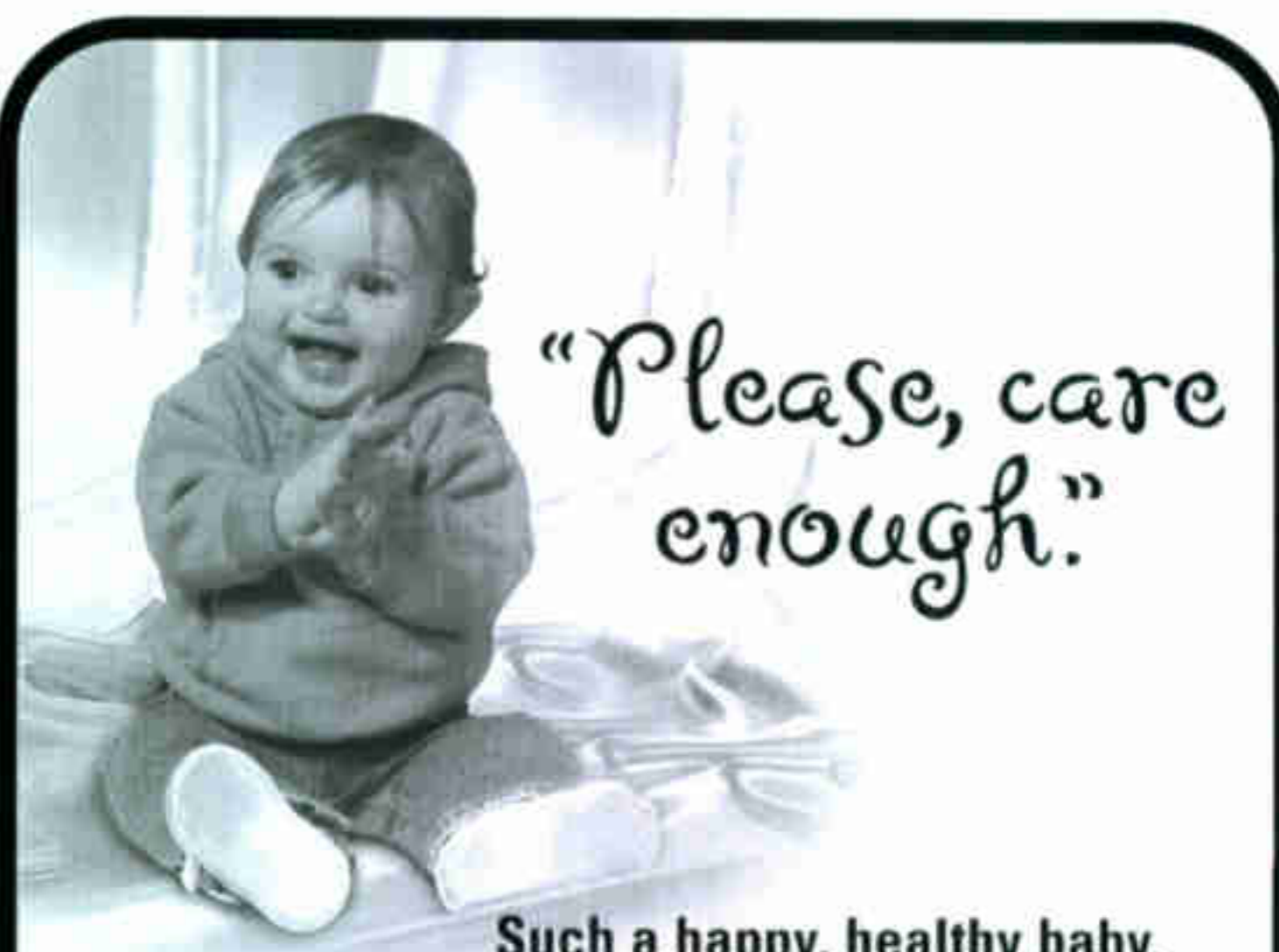
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PENNY DE LOS SANTOS (BOTH)



CULTURE

Mariachi Hits the Classroom

South-of-the-border music moves north

To many people in the United States, mariachi is the serenade you get in a Mexican restaurant. But as the number of Mexican Americans grows, this unique musical hybrid is moving beyond restaurants and into the classroom. Schools in California, Texas, Arizona, New Mexico, and Washington State now offer mariachi programs along with marching bands

and jazz ensembles. It's more familiar and relevant to Chicanos, say teachers, and more fun to play.

Mariachi originated in Mexico's Jalisco state in the mid-1800s among singers performing requests while playing guitar, harp, and violin. By the 1920s the music, a blend of Spanish folk songs and indigenous rhythms, was being promoted by the Mexican government to build a sense of national unity. Radio broadcasters called for a "bigger" sound, so bands added more violins, multiple trumpets, and local instruments called the *guitarrón* (a large, deep-bellied guitar) and *vihuela* (much smaller). Today's strolling pro has to know hundreds of songs by ear, since tips often depend on fulfilling diners' requests. "Play what people want," says trumpeter Rolando Morales, "or you don't make much money."

Morales helped organize the recent Mariachi Craze festival in

El Paso, one of many such events around the country. Some 300 students participated in lessons (left), seminars, and performances (above). Not all were of Mexican descent, and not all were school kids. "One guy," says Morales, "already had his Ph.D."

—Margaret Zackowitz

SIGNS

Where A beach at Port Douglas, in northeastern Australia

What to beware of at any north Australian beach

Box jellyfish (*Chironex fleckeri*), arguably the world's most venomous animal, common October through May

Deaths caused by box

jellyfish More than 60 in the past half century

Venom potency Victims can die in four agonizing minutes.

Jellyfish's top speed Five feet a second, in bursts (but they don't pursue their prey).



Behind the SCENES

AT THE NATIONAL GEOGRAPHIC SOCIETY

A New Look at Everest

Digital model lets mapmakers move mountains

The Mount Everest map supplement in this issue is the most detailed map ever produced of the planet's highest mountain. But that's just the beginning: The digital data that enabled the Society's cartographers to produce the map can be massaged and manipulated to make all sorts of physical information about Everest more clear.

For example, with a computer mapmakers can "show the mountain from any view," says Allen Carroll, National Geographic's chief cartographer. "Using geographic information system software, we can assign different colors for different elevations or illustrate how steep a slope is. We can show routes used by climbers. Or shine a virtual light on the mountain from any direction."

The virtual Everest is built from 34,255,000 data points, each

containing three basic pieces of information: latitude, longitude, and height above sea level. The data points were derived from an aerial photography expedition organized by veteran explorer Bradford Washburn for the magazine's November 1988 map of Everest. The images were recently rescanned by Swissphoto AG.

The producers of National Geographic Television & Film's *Surviving Everest* (National Geographic Channel, April 27 and May 29, 8 p.m. ET/PT) used the same data set to make graphics that take viewers up the mountain from camp to camp with mountaineers Peter Hillary,

Jamling Norgay, and Brent Bishop, sons of early explorers. (Readers can experience this 3-D representation at nationalgeographic.com/ngm/0305.)

Just a few years ago the calculating power needed to perform many of the manipulations would have required a supercomputer. "Now," says Carroll, "we're doing it on a desktop."

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Croc Swallows Camera

Close call to be broadcast

Brady Barr has tried lots of tricks to get near crocodiles for his series *Reptile Wild*, airing Sundays at 10 p.m. ET/PT on the National Geographic Channel. His latest tactic: mounting a video camera on a remote-control toy car and sending it to film a sunbathing Nile crocodile in South Africa. That's when the trouble started.

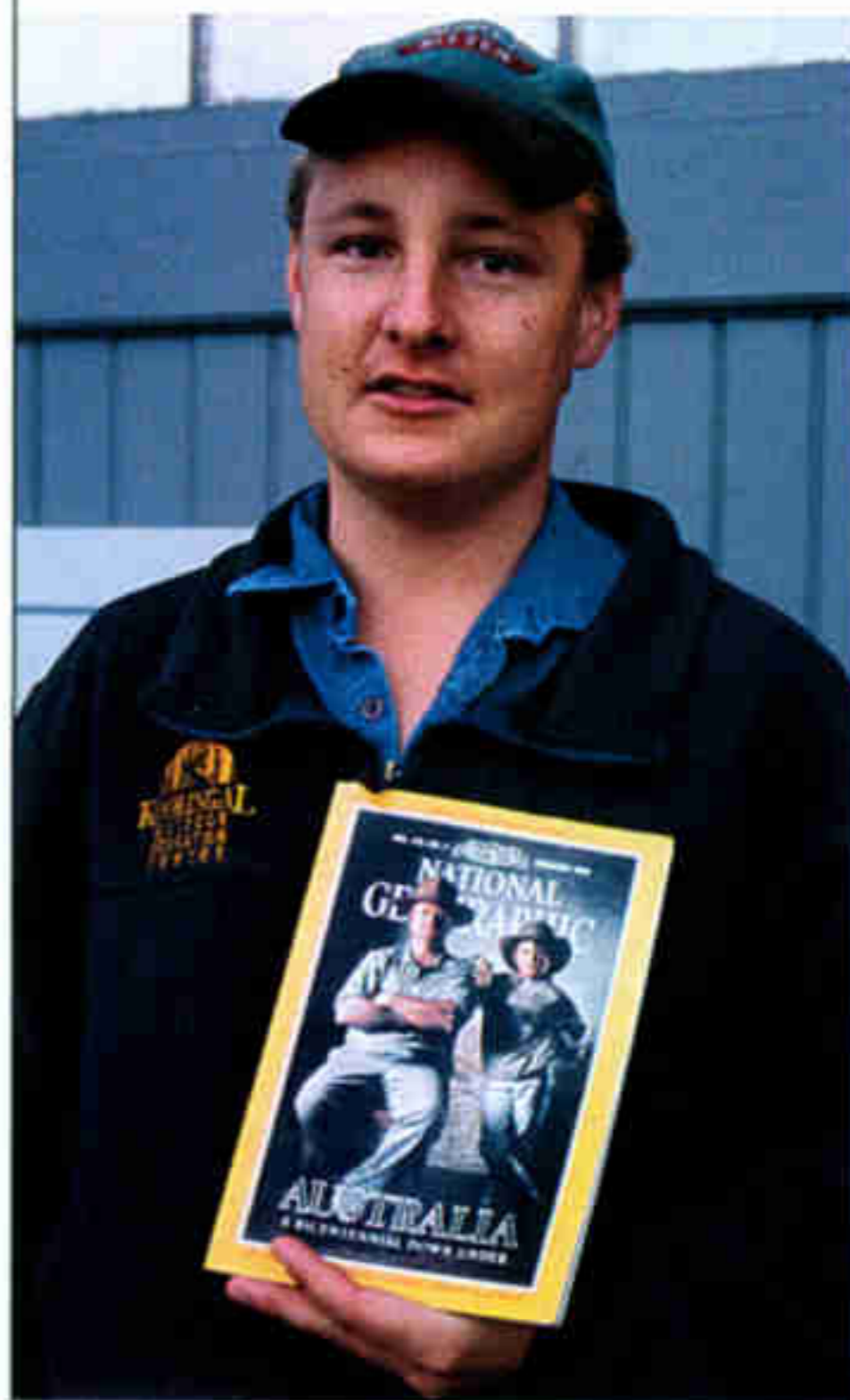
As the car neared the crocodile, a second croc rose out of the water, chased the car, and snatched the camera in its jaws. "I jump out of my boat and the croc submerges," Brady says. "Then it surfaces, and it and a third crocodile start to play tug-of-war with the camera. They submerge again, and that's the end of it."

Well, almost. A few weeks later, one of Brady's South African colleagues, biologist Hannes Botha, called: He'd found the camera, covered with mud and teeth marks (above). Brady thinks a croc may have swallowed the camera, then later regurgitated it. The tape inside was damaged, but you can see it all happen in *Crocs in Crisis* on the Channel on May 4.

CHECKING IN

...With a Cover Boy

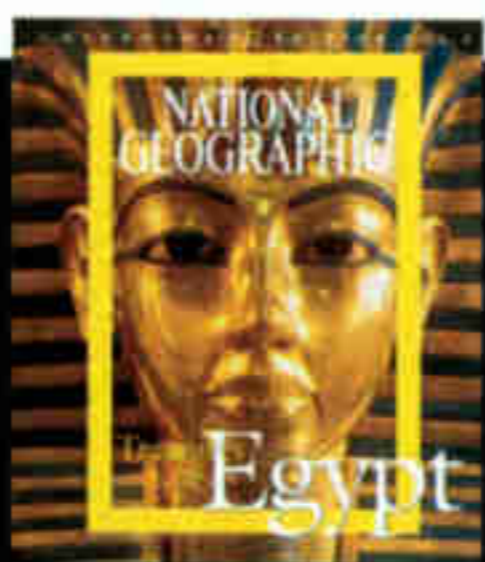
Photographer Melissa Farlow was working in Kentucky's horse country when a young man approached her at Nuckols Farm in Midway. "I've got something to show you," he said, pointing to the Australian boy on the cover of the February 1988 issue. "That's me." Boots McTaggart (below), now 25, was near the end of a yearlong trip around the world when he spent a month at Nuckols learning how a breeding farm works. He's now in agribusiness finance at an Australian bank.



Egypt Special Issue



NATIONAL GEOGRAPHIC's first article on ancient Egypt appeared in 1901; the most recent came in January of this year. *Treasures of Egypt* (above), a special collector's edition of the magazine's best photos of Egypt—like this relief from a Saqqara tomb (left) by Kenneth Garrett, who has shot more GEOGRAPHIC stories on the subject than any other photographer—appears on newsstands and in bookstores May 1. Order online (nationalgeographic.com/ngm/egypt) through July.



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SHIFTING LEARNING INTO HIGH GEAR

High school auto repair shops get an upgrade, while students gain real-world skills



Students at Philadelphia's Swenson Arts and Technology and West Philadelphia high schools will graduate with more than a diploma. They'll leave with a carload of experience and skills in everything from overhauling transmissions to analyzing antilock brake computer systems. With State Farm's lead, and the help of 22 industry partners, the schools are participating in a Service-Learning program that revamps school auto repair shops with cutting-edge technology, new curricula, equipment, supplies, vehicles, and professional development for teachers. Philadelphia's students aren't the only ones who win—the auto repair industry is facing a critical shortage of quality entry-level employees, and can't wait for these students to enter the job market.

Service-Learning Spells Hands-On Success.

Learning isn't only what students know, but what they're able to do. Led by that philosophy, the Service-Learning teaching method gives students a unique chance to directly apply what they learn. Service-Learning provides workplace skills, develops leadership potential, and instills civic responsibility. State Farm supports Service-Learning programs coast-to-coast, reflecting our belief that strong communities begin with investing in the lives and futures of young people.

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	BEFORE	AFTER
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National Honor Society members	2%	8%
Students bound for post-secondary education	40%	62%

**Results of study at Putnam High School, Springfield, MA*

For more information on Service-Learning visit <http://www.statefarm.com/edexcell/involve.htm>



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Summit Everest



From virtual vistas to historic footage, our coverage of the 50th anniversary of the summiting of Everest continues at nationalgeographic.com/everest. Get a Sherpa's-eye view with an interactive 360-degree image from the top and relive one of the Society's greatest expeditions ever, the first American trek to the summit (above), with text and photos from legendary mountaineer Barry Bishop's original 1963 NATIONAL GEOGRAPHIC magazine story (plus rare video of President Kennedy congratulating the climbers). You'll also find desktop wallpaper, interviews, field notes, and more.

BARRY C. BISHOP (ABOVE); JÓZSEF L. SZENTPÉTERI

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VIAGRA is indicated for the treatment of erectile dysfunction.

Remember that no medicine is for everyone. If you use nitrate drugs, often used to control chest pain (also known as angina), don't take VIAGRA. This combination could cause your blood pressure to drop to an unsafe or life-threatening level.

Discuss your general health status with your doctor to ensure that you are healthy enough to engage in sexual activity. If you experience chest pain, nausea, or any other discomforts during sex or an erection that lasts longer than 4 hours, seek immediate medical help. The most common side effects of VIAGRA are headache, facial flushing, and upset stomach. Less commonly, bluish vision, blurred vision, or sensitivity to light may briefly occur.

Please see patient summary of information for VIAGRA (25-mg, 50-mg, 100-mg) tablets on the following page.

The one that works for millions.™



PATIENT SUMMARY OF INFORMATION ABOUT

VIAGRA® (sildenafil citrate) tablets

This summary contains important information about VIAGRA®. It is not meant to take the place of your doctor's instructions. Read this information carefully before you start taking VIAGRA. Ask your doctor or pharmacist if you do not understand any of this information or if you want to know more about VIAGRA.

This medicine can help many men when it is used as prescribed by their doctors. However, VIAGRA is not for everyone. It is intended for use only by men who have a condition called erectile dysfunction. **VIAGRA must never be used by men who are taking medicines that contain nitrates of any kind, at any time. This includes nitroglycerin. If you take VIAGRA with any nitrate medicine your blood pressure could suddenly drop to an unsafe or life threatening level.**

What Is VIAGRA?

VIAGRA is a pill used to treat erectile dysfunction (impotence) in men. It can help many men who have erectile dysfunction get and keep an erection when they become sexually excited (stimulated).

You will not get an erection just by taking this medicine. VIAGRA helps a man with erectile dysfunction get an erection only when he is sexually excited.

How Sex Affects the Body

When a man is sexually excited, the penis rapidly fills with more blood than usual. The penis then expands and hardens. This is called an erection. After the man is done having sex, this extra blood flows out of the penis back into the body. The erection goes away. If an erection lasts for a long time (more than 6 hours), it can permanently damage your penis. You should call a doctor immediately if you ever have a prolonged erection that lasts more than 4 hours.

Some conditions and medicines interfere with this natural erection process. The penis cannot fill with enough blood. The man cannot have an erection. This is called erectile dysfunction if it becomes a frequent problem.

During sex, your heart works harder. Therefore sexual activity may not be advisable for people who have heart problems. Before you start any treatment for erectile dysfunction, ask your doctor if your heart is healthy enough to handle the extra strain of having sex. If you have chest pains, dizziness or nausea during sex, stop having sex and immediately tell your doctor you have had this problem.

How VIAGRA Works

VIAGRA enables many men with erectile dysfunction to respond to sexual stimulation. When a man is sexually excited, VIAGRA helps the penis fill with enough blood to cause an erection. After sex is over, the erection goes away.

VIAGRA Is Not for Everyone

As noted above (*How Sex Affects the Body*), ask your doctor if your heart is healthy enough for sexual activity.

If you take any medicines that contain nitrates—either regularly or as needed—you should never take VIAGRA. If you take VIAGRA with any nitrate medicine or recreational drug containing nitrates, your blood pressure could suddenly drop to an unsafe level. You could get dizzy, faint, or even have a heart attack or stroke. Nitrates are found in many prescription medicines that are used to treat angina (chest pain due to heart disease) such as:

- nitroglycerin (sprays, ointments, skin patches or pastes, and tablets that are swallowed or dissolved in the mouth)
- isosorbide mononitrate and isosorbide dinitrate (tablets that are swallowed, chewed, or dissolved in the mouth)

Nitrates are also found in recreational drugs such as amyl nitrate or nitrite ("poppers"). If you are not sure if any of your medicines contain nitrates, or if you do not understand what nitrates are, ask your doctor or pharmacist.

VIAGRA is only for patients with erectile dysfunction. VIAGRA is not for newborns, children, or women. Do not let anyone else take your VIAGRA. VIAGRA must be used only under a doctor's supervision.

What VIAGRA Does Not Do

- VIAGRA does not cure erectile dysfunction. It is a treatment for erectile dysfunction.
- VIAGRA does not protect you or your partner from getting sexually transmitted diseases, including HIV—the virus that causes AIDS.
- VIAGRA is not a hormone or an aphrodisiac.

What To Tell Your Doctor Before You Begin VIAGRA

Only your doctor can decide if VIAGRA is right for you. VIAGRA can cause mild, temporary lowering of your blood pressure. You will need to have a thorough medical exam to diagnose your erectile dysfunction and to find out if you can safely take VIAGRA alone or with your other medicines. Your doctor should determine if your heart is healthy enough to handle the extra strain of having sex.

Be sure to tell your doctor if you:

- have ever had any heart problems (e.g., angina, chest pain, heart failure, irregular heart beats, heart attack or narrowing of the aortic valve)
- have ever had a stroke
- have low or high blood pressure
- have a rare inherited eye disease called retinitis pigmentosa

- have ever had any kidney problems
- have ever had any liver problems
- have ever had any blood problems, including sickle cell anemia or leukemia
- are allergic to sildenafil or any of the other ingredients of VIAGRA tablets
- have a deformed penis, Peyronie's disease, or ever had an erection that lasted more than 4 hours
- have stomach ulcers or any types of bleeding problems
- are taking any other medicines

VIAGRA and Other Medicines

Some medicines can change the way VIAGRA works. Tell your doctor about **any medicines** you are taking. Do not start or stop taking any medicines before checking with your doctor or pharmacist. This includes prescription and nonprescription medicines or remedies.

- Remember, VIAGRA should never be used with medicines that contain nitrates (see *VIAGRA Is Not for Everyone*).
- If you are taking alpha-blocker therapy for the treatment of high blood pressure or prostate problems, you should not take a dose of greater than 25 mg of VIAGRA at the same time (within 4 hours) as you take your dose of alpha-blocker.
- If you are taking a protease inhibitor, your dose may be adjusted (please see *Finding the Right Dose for You*.)
- VIAGRA should not be used with any other medical treatments that cause erections. These treatments include pills, medicines that are injected or inserted into the penis, implants or vacuum pumps.

Finding the Right Dose for You

VIAGRA comes in different doses (25 mg, 50 mg and 100 mg). If you do not get the results you expect, talk with your doctor. You and your doctor can determine the dose that works best for you.

- Do not take more VIAGRA than your doctor prescribes.
- If you think you need a larger dose of VIAGRA, check with your doctor.
- VIAGRA should not be taken more than once a day.

If you are older than age 65, or have serious liver or kidney problems, your doctor may start you at the lowest dose (25 mg) of VIAGRA. If you are taking protease inhibitors, such as for the treatment of HIV, your doctor may recommend a 25 mg dose and may limit you to a maximum single dose of 25 mg of VIAGRA in a 48 hour period. If you are taking alpha-blocker therapy, you should not take a dose of greater than 25 mg of VIAGRA at the same time (within 4 hours) as your dose of alpha-blocker.

How To Take VIAGRA

Take VIAGRA about one hour before you plan to have sex. Beginning in about 30 minutes and up to 4 hours, VIAGRA can help you get an erection if you are sexually excited. If you take VIAGRA after a high-fat meal (such as a cheeseburger and french fries), the medicine may take a little longer to start working. VIAGRA can help you get an erection when you are sexually excited. You will not get an erection just by taking the pill.

Possible Side Effects

Like all medicines, VIAGRA can cause some side effects. These effects are usually mild to moderate and usually don't last longer than a few hours. Some of these side effects are more likely to occur with higher doses. The most common side effects of VIAGRA are headache, flushing of the face, and upset stomach. Less common side effects that may occur are temporary changes in color vision (such as trouble telling the difference between blue and green objects or having a blue color tinge to them), eyes being more sensitive to light, or blurred vision.

In rare instances, men have reported an erection that lasts many hours. You should call a doctor immediately if you ever have an erection that lasts more than 4 hours. If not treated right away, permanent damage to your penis could occur (see *How Sex Affects the Body*).

Heart attack, stroke, irregular heart beats, and death have been reported rarely in men taking VIAGRA. Most, but not all, of these men had heart problems before taking this medicine. It is not possible to determine whether these events were directly related to VIAGRA.

VIAGRA may cause other side effects besides those listed on this sheet. If you want more information or develop any side effects or symptoms you are concerned about, call your doctor.

Accidental Overdose

In case of accidental overdose, call your doctor right away.

Storing VIAGRA

Keep VIAGRA out of the reach of children. Keep VIAGRA in its original container. Store at 25°C (77°F); excursions permitted to 15-30°C (59-86°F) [see USP Controlled Room Temperature].

For More Information on VIAGRA

VIAGRA is a prescription medicine used to treat erectile dysfunction. Only your doctor can decide if it is right for you. This sheet is only a summary. If you have any questions or want more information about VIAGRA, talk with your doctor or pharmacist, visit www.viagra.com, or call 1-888-4VIAGRA.

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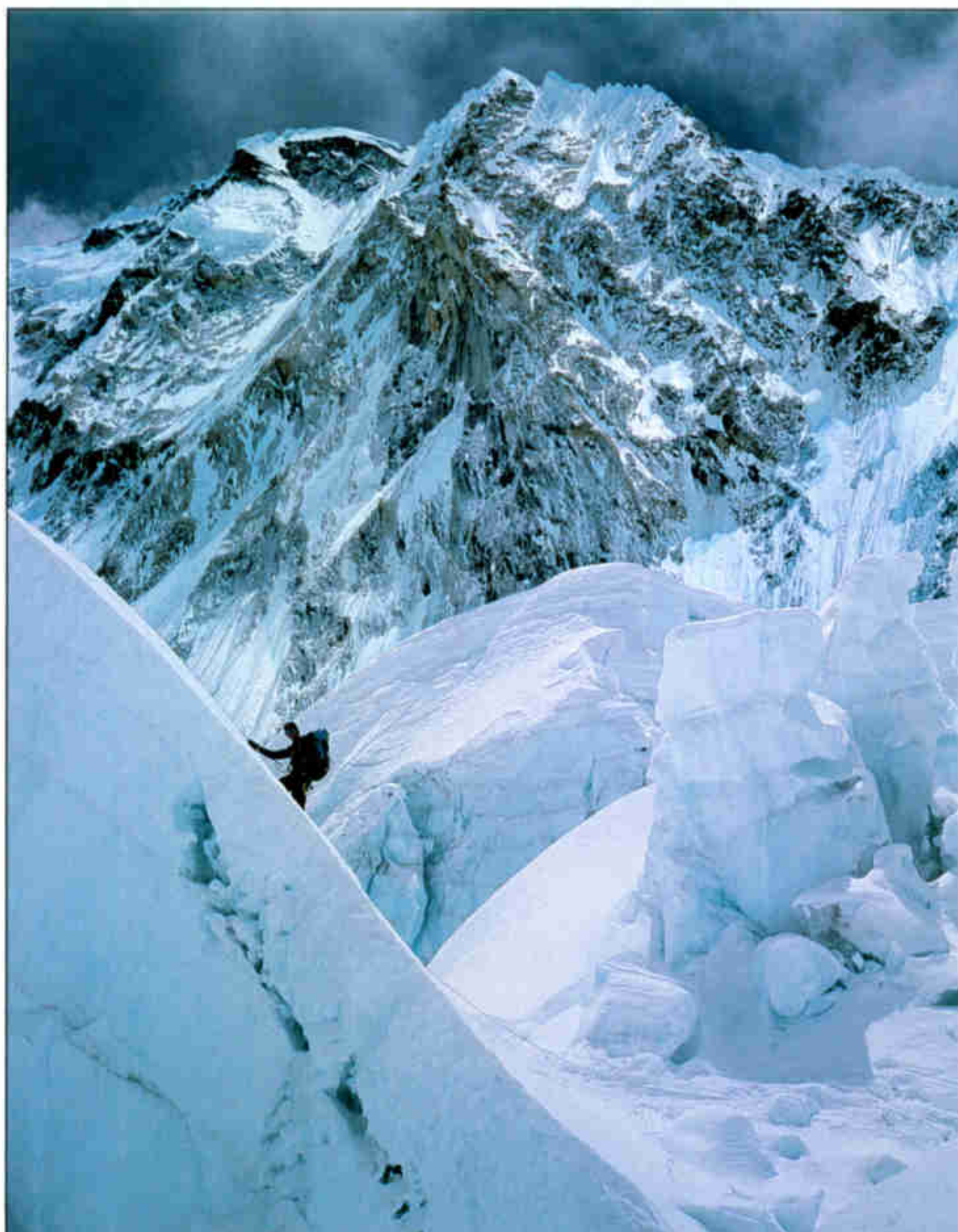
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WATCH "SURVIVING EVEREST" ON NATIONAL GEOGRAPHIC CHANNEL, APRIL 27, 8 P.M. ET/PT

National Geographic TV



JIM SURETTE (ABOVE); CHRIS TAIT



NATIONAL GEOGRAPHIC
CHANNEL, APRIL 27, 8 P.M.

Surviving Everest

Their fathers led the way to the top of the world; now the sons gather to mount a historic expedition to follow in their footsteps and learn anew the danger and seduction of Mount Everest. Fifty years after Edmund Hillary and Tenzing Norgay reached the summit, and 40 years after NATIONAL GEOGRAPHIC photographer and writer Barry Bishop became one of the first Americans to make it to the top, *Surviving Everest* tells the gripping tale of their sons, as they team up to confront the same deadly obstacles—fierce winds, collapsing ice blocks, and hidden crevasses. Jamling Norgay, Brent Bishop, and Peter Hillary (bottom, left to right) stop in villages to visit surviving members of their fathers' expeditions and learn how the influx of tourists has affected the Sherpa people. Then they begin their climb, led by Pete Athans, veteran of 15 summit attempts, who forges a route through the Khumbu Icefall (top). But *Surviving Everest*, a two-hour global television event, is more than a story of a daunting ascent; it's the story of sons climbing closer to their fathers. The show will also air May 29, the anniversary day, at 8 p.m. ET/PT.

National Geographic EXPLORER MSNBC. Sundays, 8 p.m. ET/5 p.m. PT. National Geographic Specials PBS. See local listings. National Geographic Videos, Kids Videos, and DVDs Call 1-800-627-5162. National Geographic Channel Call your cable or satellite provider.

■ Programming information accurate at press time; consult local listings or our website at nationalgeographic.com

Who Knew?

HISTORY OF SCIENCE

Publish or Perish

The untold story of Thomas Harriot, the greatest scientist you've never heard of

Everyone knows Galileo was the first astronomer to point a telescope at the night sky. But like many facts that everyone knows, this one isn't true. Precedence should probably go to Thomas Harriot. What Harriot didn't do was publish his observations. Being first is important, but so is publicity.

Harriot was an Englishman best known for writing an early natural history of North America. In 1585 he sailed west for his sponsor, Sir Walter Raleigh, who hoped to found a colony in the New World. Harriot's account, *A Briefe and True Report of the New Found Land of Virginia*, is considered an ethnographic treasure for its descriptions of Native Americans. He also enthused about the health benefits of smoking tobacco: "It purgeth superfluous fleame & other grosse humors, openeth all the pores & passages of the body." Smokers, he said, rarely get sick.

Harriot went on to become one of the greatest scientists in the world—but one who never quite got his due. He made advances in algebra and optics. He discovered Snell's law of refraction before Snell did (and quite obviously didn't get the credit).

In August 1609 Harriot used a telescope to look at the moon, magnified six times. Not until four months later did Galileo, in Padua, Italy, study the moon with his telescope. Then, in December 1610, Harriot became the first Westerner to observe sunspots through a telescope

(naked-eye observations in China beat Harriot's by about 1,800 years).

And yet he didn't publish his work. Galileo, who more fully appreciated the telescope's possibilities, seized the moment. He discovered four moons of Jupiter and saw that Venus has phases, like our moon. He peered into the Milky Way and saw, for the first time, that it's made of countless individual stars.

And Galileo published. His first book on his new astronomical studies, *The Starry Messenger*, came out just ten days after he made his final observations. Throughout his career he had the intellectual chutzpah to trumpet the implications of his work. Before Galileo, few dared to think of the moon or the sun as blemished or imperfect. He wasn't afraid to say *this changes everything*.

Harriot also came up with bold hypotheses. But he struggled to put the final touches on his research. He stalled, tinkering with details. Maybe it was because, as a kind of house scientist to noblemen, he was not expected to publish. Or maybe it was his personality. A friend tried to appeal to his ego, writing to Harriot that his procrastination "hath rob'd you of . . . glories." But he still had difficulty completing projects.

On his deathbed Harriot asked that his executors organize his scientific papers. Didn't happen. His manuscripts were lost for more than 150 years and finally discovered amid some horse stable accounts. His papers are notoriously disorderly; scholars have spent decades trying to make sense of them.

Oh, and he was wrong about smokers rarely getting sick. Around 1611 cancer appeared in his nose and, after many miserable years, killed him.

—Joel Achenbach

WASHINGTON POST STAFF WRITER

IT MATTERS

Galileo didn't publish his observations in scholarly journals.

They didn't exist in his lifetime. Scientific publishing as we know it, with experts reviewing manuscripts before they're made public, developed slowly before the 20th century. Today scientific peer review still matters. The sheer volume and specialization of modern research means that even a brilliant editor of a narrowly focused journal needs help evaluating submissions. Reviewers report on whether articles show sound investigative techniques, logical analysis, and plausible conclusions. Though most scientists recognize flaws in the process—it can tend to slow the spread of new data and stifle original thinking—peer-reviewed publications remain the gold standard: reliable sources for credible science.

—Lynne Warren

WEBSITE EXCLUSIVE

Learn more about Thomas Harriot—and find a link to Joel Achenbach's work—at nationalgeographic.com/ngm/resources/0305.

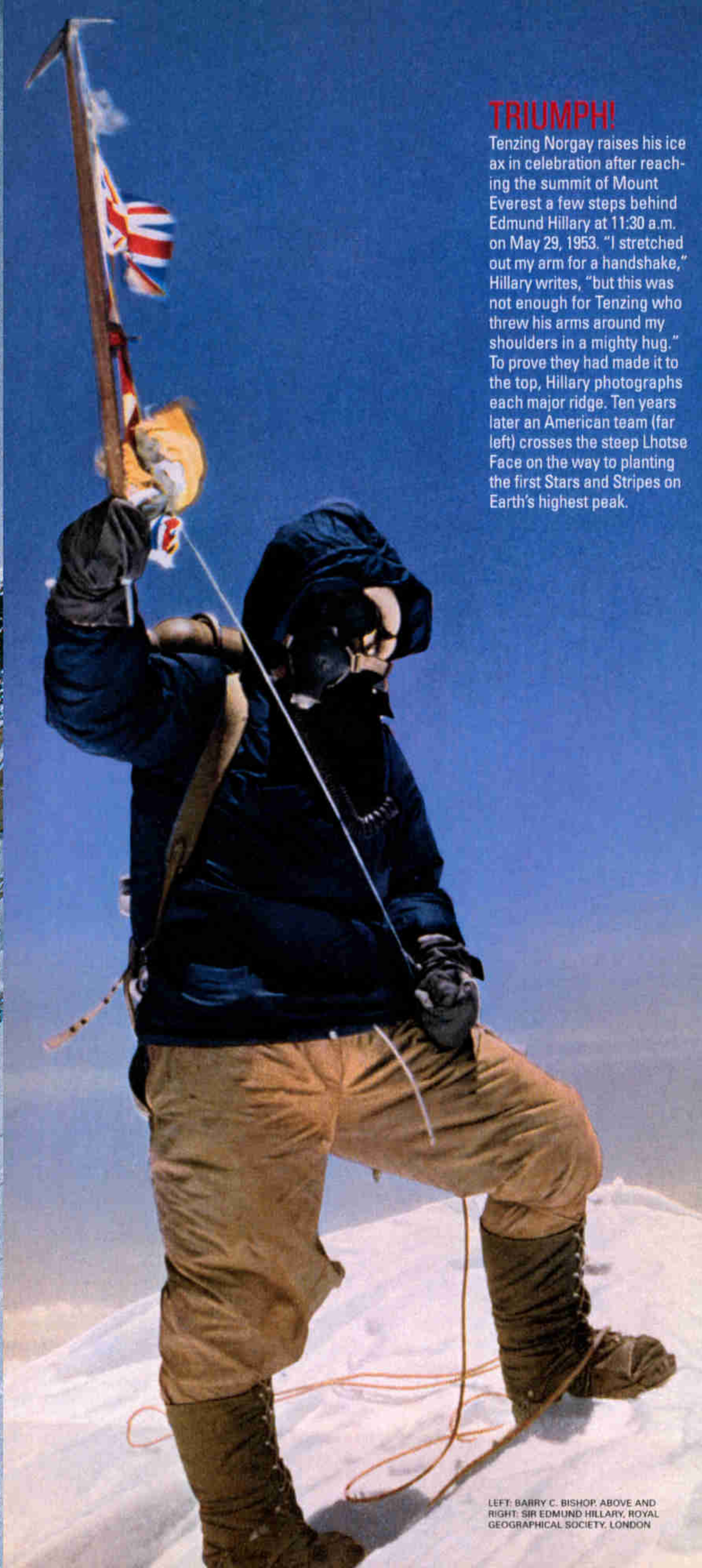
Everest



st

50 YEARS AND COUNTING

Edmund Hillary and Tenzing Norgay were the first two. Since them, 1,200 men and women from 63 nations have reached the summit. What does it take to stand on top of the world?



TRIUMPH!

Tenzing Norgay raises his ice ax in celebration after reaching the summit of Mount Everest a few steps behind Edmund Hillary at 11:30 a.m. on May 29, 1953. "I stretched out my arm for a handshake," Hillary writes, "but this was not enough for Tenzing who threw his arms around my shoulders in a mighty hug." To prove they had made it to the top, Hillary photographs each major ridge. Ten years later an American team (far left) crosses the steep Lhotse Face on the way to planting the first Stars and Stripes on Earth's highest peak.



LEFT: BARRY C. BISHOP; ABOVE AND RIGHT: SIR EDMUND HILLARY, ROYAL GEOGRAPHICAL SOCIETY, LONDON



GIANT SHADOW

Dawn's first light strikes a peak west of Everest, whose pyramid-like shadow dominates both land and sky. Wally Berg captured this view in 1998 on his way to the summit of Everest, where he set up a global positioning system receiver. Data from the receiver later reveals Everest's true height to be 29,035 feet—seven feet taller than previously believed.





50 YEARS The Big E

“Well George, we knocked the bastard off!” Hillary boasted to teammate George Lowe as he and Tenzing descended from Everest’s summit, having succeeded where ten previous attempts had failed. Yet neither Hillary, Tenzing, nor expedition leader John Hunt had come to the mountain expecting personal fame. “It was not glory we sought,” Hunt wrote of his team, “unless it be the common glory of man’s triumph over Nature—and over his own limitations.”

This month, as we celebrate the 50th anniversary of the 1953 British expedition, hundreds of climbers are expected to take on the mountain they call the Big E. Some will pay up to \$65,000 to be guided to the top. Others will come for publicity, profit, or a place in the record books. No matter why they come, anyone aiming for the summit must face the Death Zone above 26,000 feet, where survival is always tenuous. “There are a hundred ways to get killed on Everest,” says Pete Athans, who has summited seven times. “The adventure is controlling your own fears and ignorance.”

With luck many will succeed—a record 89 climbers tagged the top on a single day in 2001. But only the foolish will underestimate the power of a giant that has snuffed out 175 lives. Better to approach with respect and humility, writes Tenzing’s son Jamling who followed his father’s example to the top in 1996. “Humans are granted no more than an audience with Everest’s summit, and then only rarely and for brief moments.”

WEBSITE EXCLUSIVE

Ed Viesturs has summited Mount Everest five times. What does it take to reach the top? Find out at nation.algeographic.com/ngm/0305. Then decorate your desktop with a dramatic Everest image.



ALL SMILES

An exhausted Hillary relaxes after his descent to Camp IV at 21,200 feet, where he enjoys tea from a cup belonging to Tom Stobart, the expedition's cameraman. There Hillary tells his tale to a reporter who rushes the story to London as a surprise for the June 2 coronation of Elizabeth II. The Queen later knights Hillary and awards Tenzing a medal. To make the climb possible, 350 porters had carried ten tons of supplies to Base Camp (left) near the Khumbu Icefall.

**“WELL, WE WERE AFTER ALL ON THE
TOP OF THE WORLD, BUT IT WAS STILL A
LONG WAY BACK TO CAMP 6 AND IT WAS
GOING TO BE DARK VERY SOON AND
THEN WHAT WOULD WE DO?”** —DOUGAL HASTON



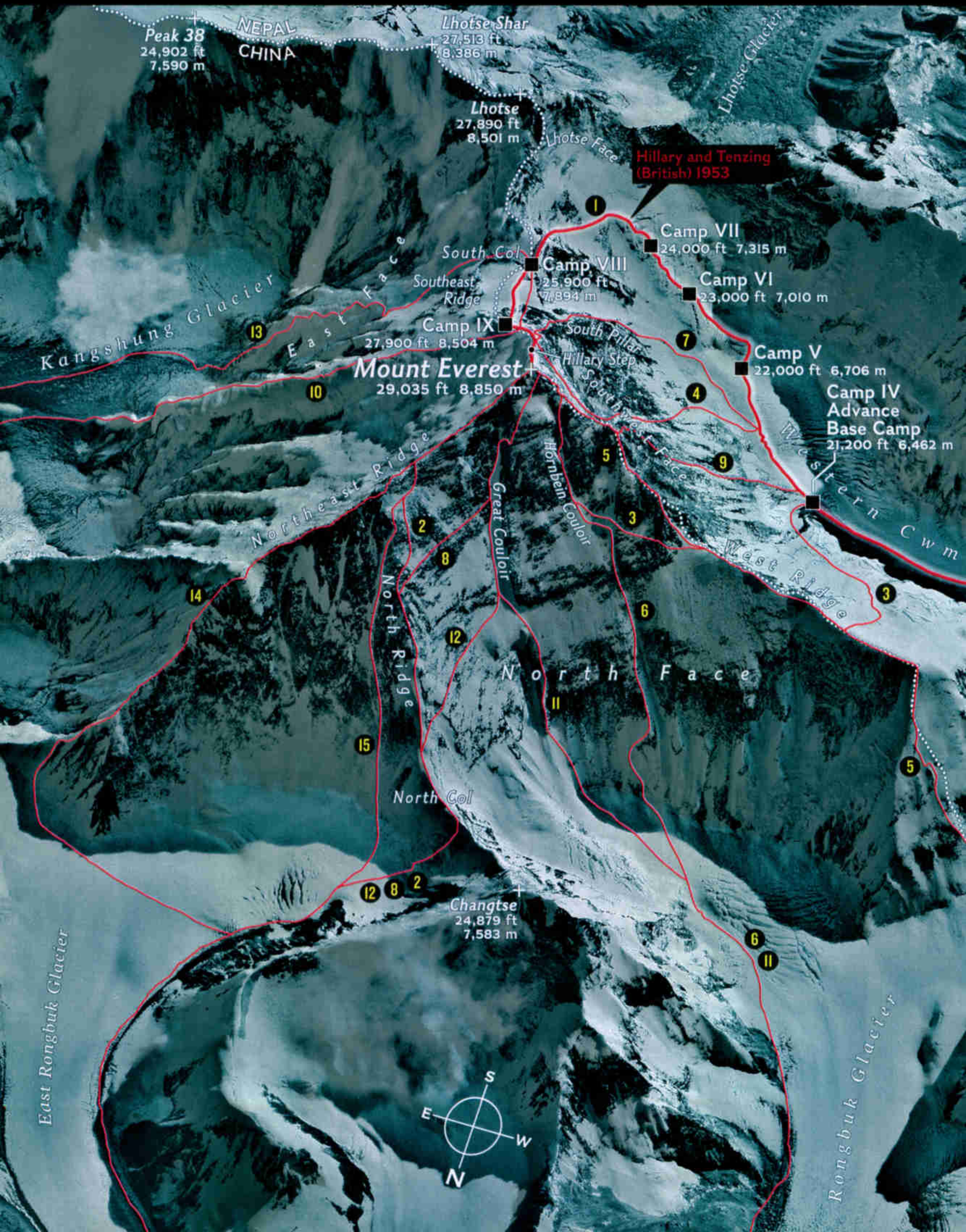


Still 250 vertical feet from the top, Dougal Haston battles deep snow on the Hillary Step as daylight slips away in these two photographs taken minutes apart on September 24, 1975. By the time he and Doug Scott reach the summit (out of the image to the right), it's too dark to descend. They survive the night by digging a snow hole at 28,700 feet.

BOTH: DOUG SCOTT

50 YEARS

The Routes





15 WAYS TO THE TOP

- 1 1953 BRITISH EXPEDITION**
Edmund Hillary and Tenzing Norgay, via the Western Cwm and the South Col, May 29.
- 2 1960 CHINESE EXPEDITION**
Via the North Col and the Northeast Ridge, May 25.
- 3 1963 U.S. EXPEDITION**
Via the West Ridge with traverse of the North Face. Final 800 feet on the West Ridge, May 22.
- 4 1975 BRITISH EXPEDITION**
Via the Southwest Face, September 24.
- 5 1979 YUGOSLAVIAN EXPEDITION**
Via the entire West Ridge, May 13.
- 6 1980 JAPANESE EXPEDITION**
Via the North Face, May 10.
- 7 1980 POLISH EXPEDITION**
Via the east side of the South Pillar, May 19.
- 8 1980 MESSNER SOLO EXPEDITION**
Reinhold Messner, via the North Col and North Face. First solo ascent without supplemental oxygen, August 20.
- 9 1982 SOVIET EXPEDITION**
Via the Southwest Face and the West Ridge, May 4.
- 10 1983 U.S. EXPEDITION**
Via the East Face, October 8.
- 11 1984 AUSTRALIAN EXPEDITION**
Via the entire Great Couloir of the North Face, October 3.
- 12 1984 U.S. EXPEDITION**
Via the upper North Face, October 20.
- 13 1988 INTERNATIONAL EXPEDITION**
Via the southern buttress of the East Face, May 12.
- 14 1995 JAPANESE EXPEDITION**
Via the Northeast Ridge from the East Rongbuk Glacier, May 11.
- 15 1996 RUSSIAN EXPEDITION**
Via the Northeast Ridge from a couloir to its east, May 20.

CAMPS REFER TO THE 1953 EXPEDITION. BECAUSE OF NEW GPS DATA, SOME CAMP ELEVATIONS DIFFER FROM HISTORICAL RECORDS.
SCALE VARIES IN THIS PERSPECTIVE.
DISTANCE FROM LHOTSE TO CHANGTSE IS 4.5 MILES (7.2 KILOMETERS).
AERIAL PHOTOGRAPHY AND TERRAIN MODEL BY SWISSPHOTO AG.
NATIONAL GEOGRAPHIC MAPS

50 YEARS

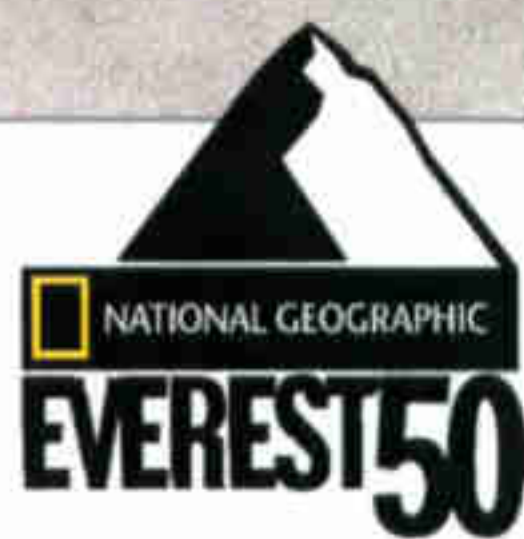
The History

BY MICHAEL KLESIOUS NATIONAL GEOGRAPHIC WRITER

“HAD MOUNT EVEREST BEEN CLIMBED AT THE FIRST ATTEMPT, THE ACHIEVEMENT WOULD HAVE BEEN HAILED AS NOTABLE AND THEN QUICKLY FORGOTTEN. IT WAS, IRONICALLY, REPEATED FAILURES WHICH GAVE THE MOUNTAIN REAL

STATURE.”

—WALT UNSWORTH, EVEREST HISTORIAN



1852

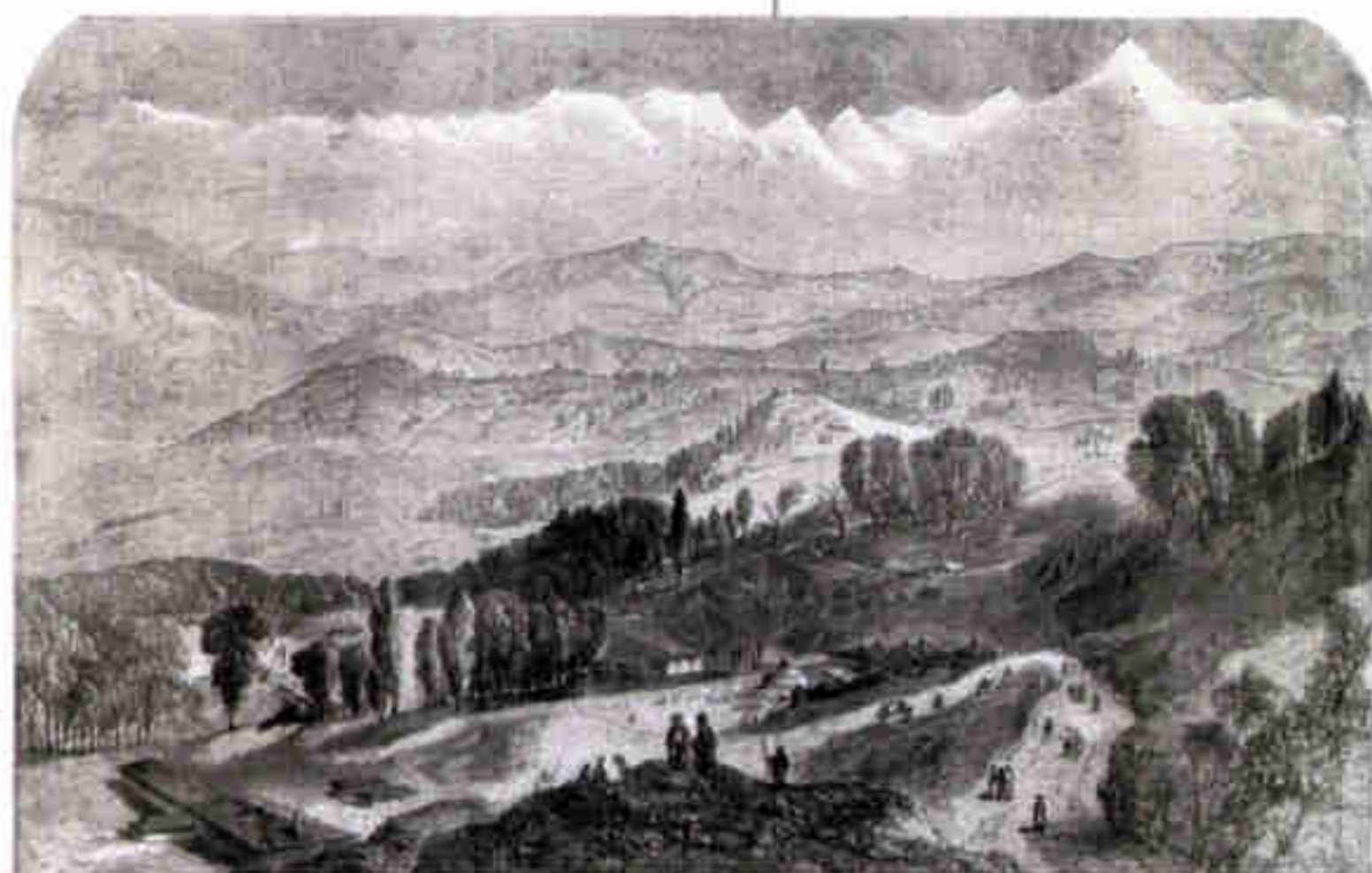
British speculate Peak XV world's tallest at 29,002 feet

In a mid-19th-century woodcut (below) of a view from Darjiling, India, the mountain monarch known as Peak XV crowds the horizon with other Himalayan giants.

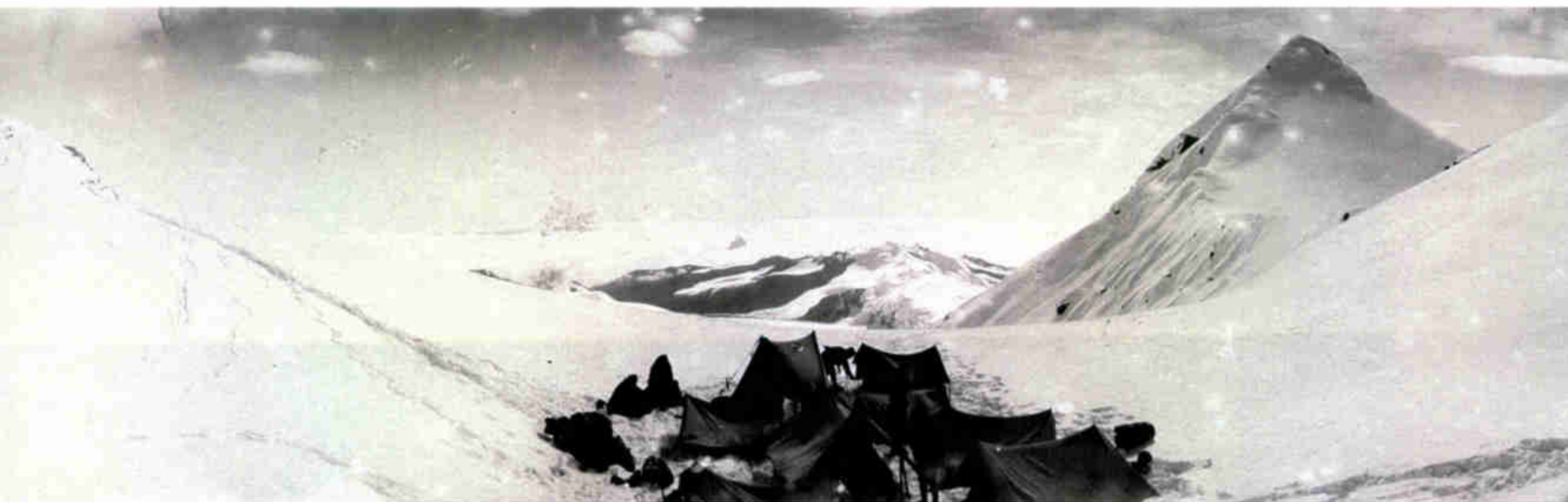
1865

Peak XV renamed for Sir George Everest

A Welshman by birth, Everest (below) serves as surveyor general of India from 1830 to 1843. His successor proposes naming the peak after him, although Everest would have preferred using a local name.



TOP: A. M. KELLAS, ROYAL GEOGRAPHICAL SOCIETY. BOTTOM: LT. COL. HOWARD-BURY, ROYAL GEOGRAPHICAL SOCIETY. RIGHT: ILLUSTRATED LONDON NEWS PICTURE LIBRARY. CENTER AND FAR RIGHT: ROYAL GEOGRAPHICAL SOCIETY





1911

Sherpas become a fixture in Himalayan climbing

Two Sherpas (above) look into Tibet from the summit ridge of Chomiomo, a 22,405-foot peak on the border between China and India, in this photo by Scottish chemist Alexander Mitchell Kellas. One of the first to study the effects of altitude on the body, Kellas learns that Sherpas, a people from the high valleys south of Everest, function well at high altitude. He dies a decade later on the first British expedition to Everest and is buried within sight of Chomiomo.

1921

June-September: First British expedition

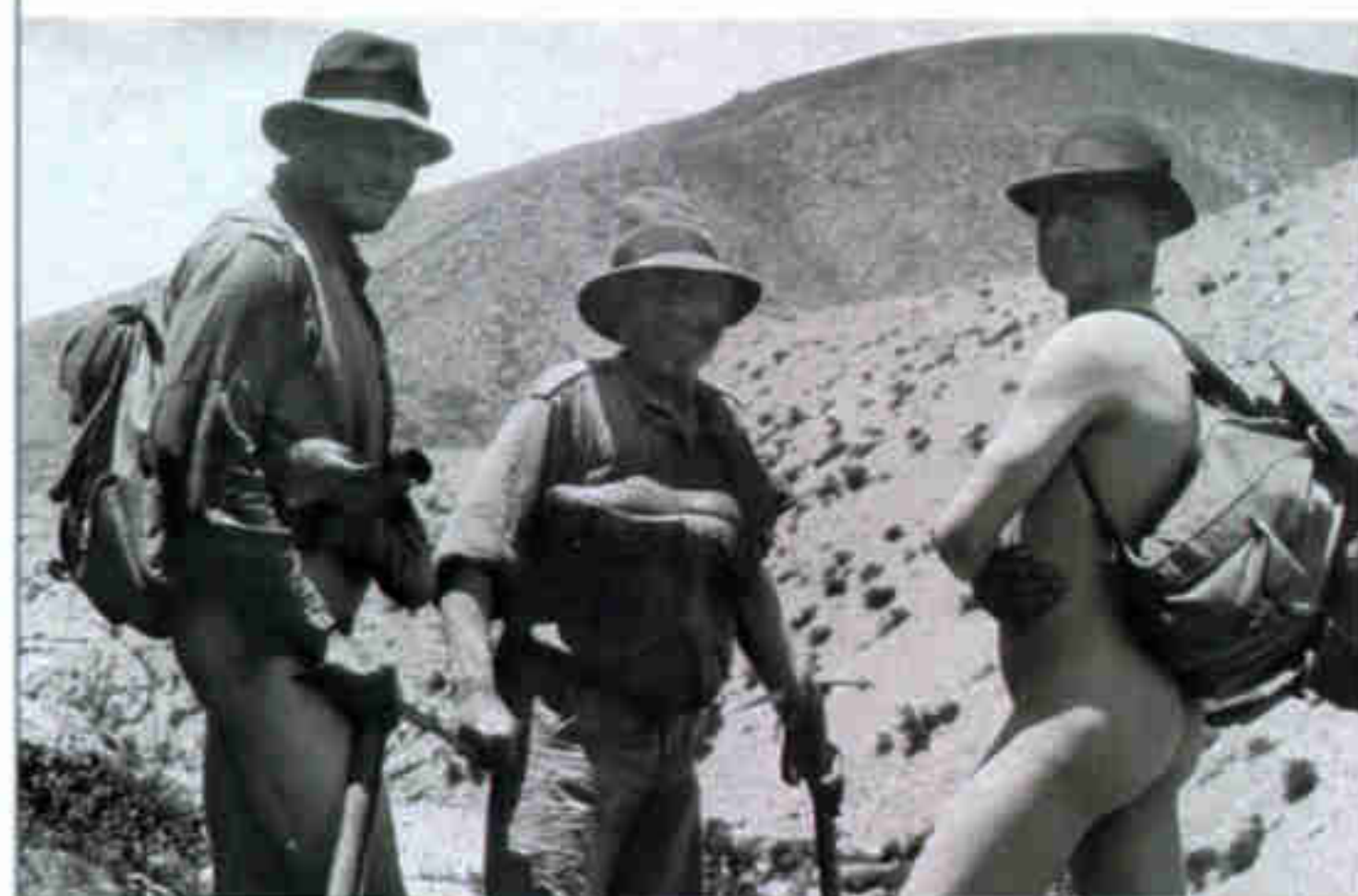
Led by Charles Howard-Bury, this expedition seeks a northern route to the peak. At the Lhakpa La (bottom), a 22,500-foot pass, the men camp within sight of what they hope to find—a route to the top. From Everest's North Col, the saddle on the right, the North Ridge route rises to the left toward the summit, hidden behind the apex of the ridge. Climber George Mallory feels overjoyed. "This success brings our reconnaissance to an end," he writes, "we have found out the way and we're now planning the attack."

1922

April-June: Second British expedition

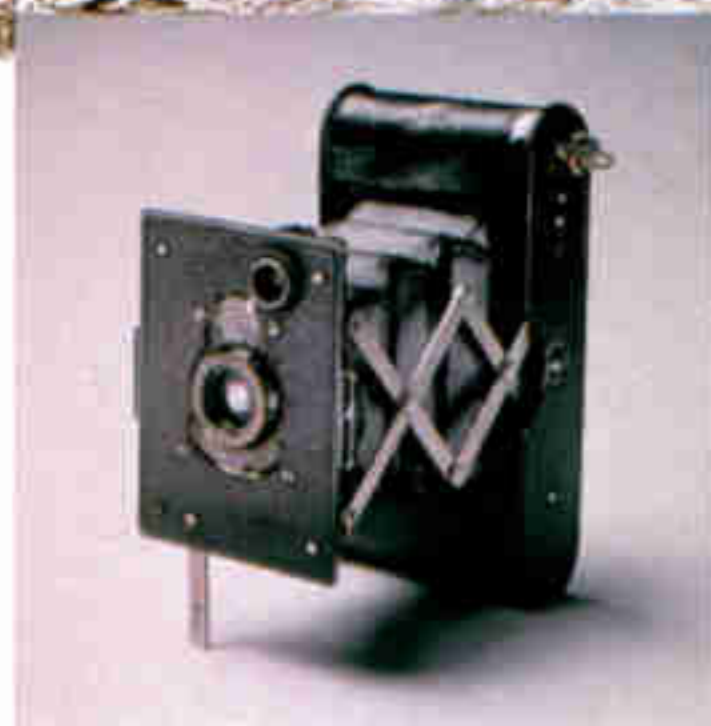
A taste for the bare essentials finds Mallory naked (below) while fording a river with half-clad Howard Somervell, at left, and Arthur Wakefield on the first

assault of Everest. Mallory's free-spirited views include a disdain for bottled oxygen. But teammates using it climb to 27,300 feet, 300 feet higher than Mallory.





“IT WAS A PRODIGIOUS WHITE FANG . . . FROM THE JAW OF THE WORLD. WE SAW MOUNT EVEREST.” —GEORGE MALLORY



1924

April-June: Third British expedition

Andrew Irvine (top, standing at left) and Mallory (next to Irvine) vanish near the top on June 8. Mallory's body is found in 1999 with goggles, altimeter, and pocketknife (above right). The Kodak Vest Pocket camera (similar to the one above) is absent, and with it any proof they may have made the summit.

1933

April 3: First flight over Everest

Two British Westland biplanes (below) fly over the peak. Powered by supercharged engines suited to the thin air, the planes almost crash from violent downdrafts near the summit. Ice fragments in Everest's windy cloud plume crack a window of one aircraft's cockpit.

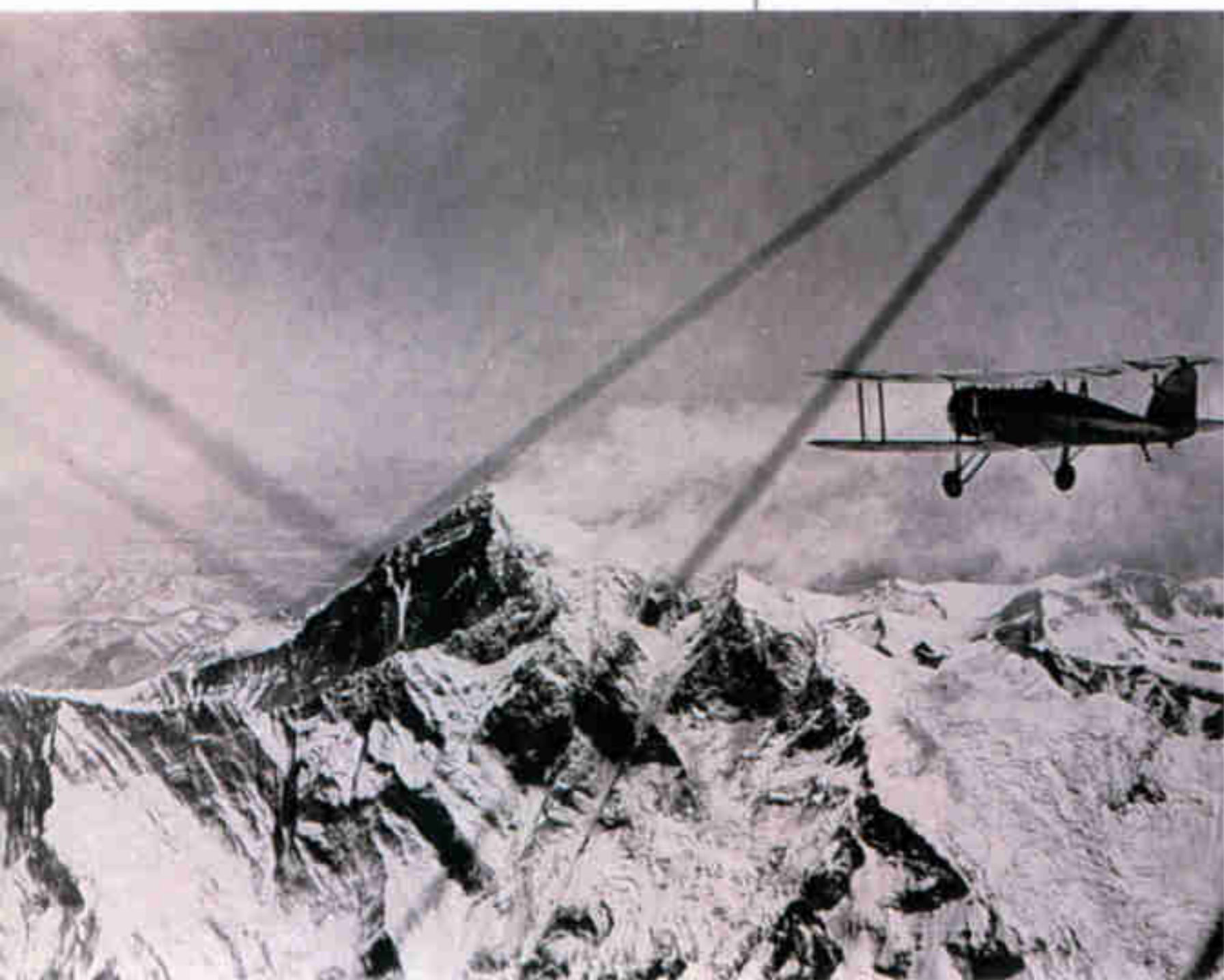


1953

March-June: First successful ascent

Some 350 Nepalese porters bring supplies to a camp at Tengboche (above), staging area for a new British attempt. The team includes Edmund Hillary, a lanky beekeeper from New Zealand, and Sherpa Tenzing Norgay, whose second name means “the fortunate one.” A year earlier Tenzing had ascended with a Swiss climber to 28,210 feet—higher than anyone before, leading many to believe the peak would soon be conquered. Leader John Hunt runs the expedition with military precision, ushering his team steadily up the mountain. By the last week

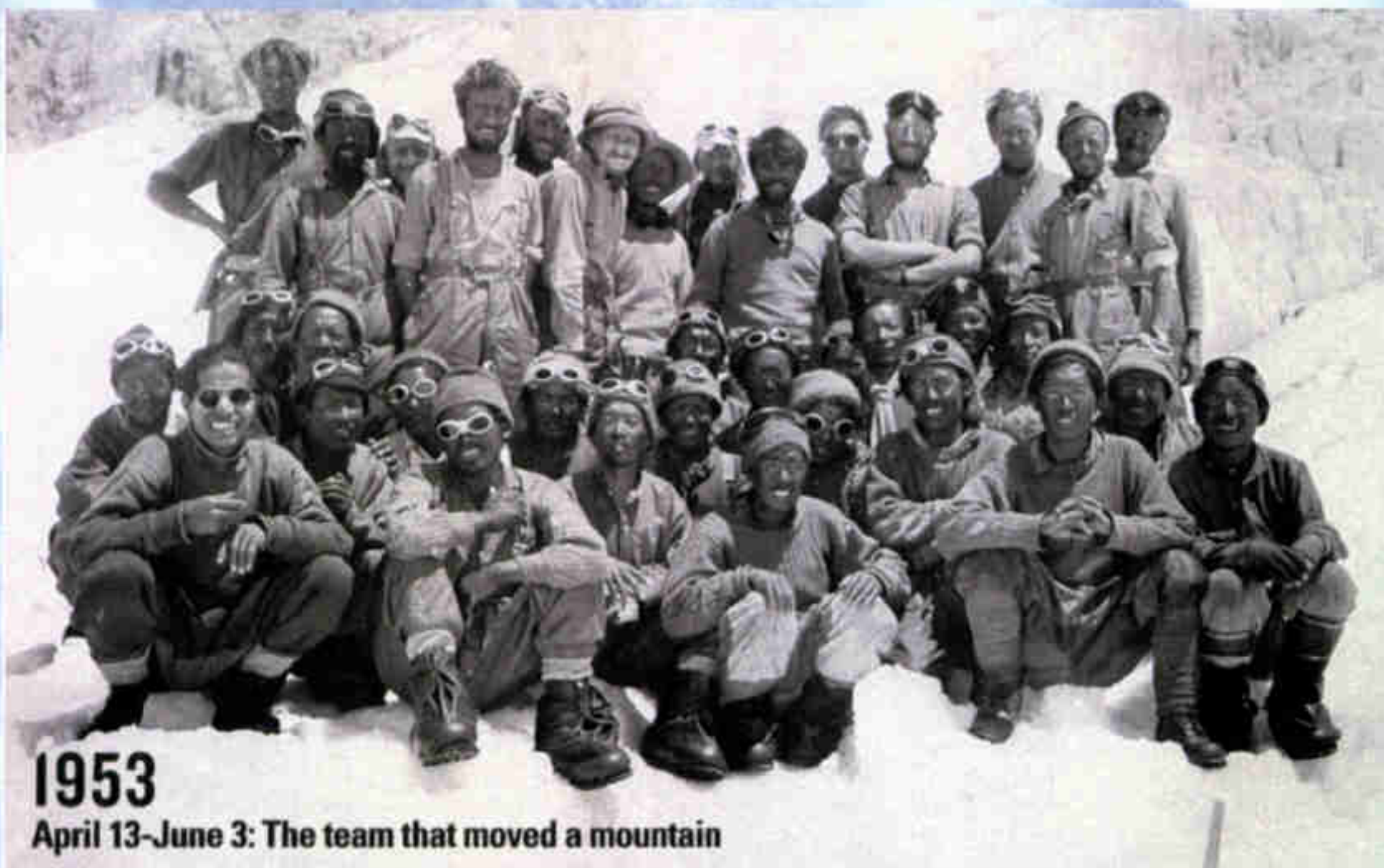
of May, Hillary (right, foreground) and Tenzing climb high on the Southeast Ridge and spend a night at 27,900 feet. Early on the 29th the two resume their climb. Hillary leads them up their last hurdle, a 40-foot vertical stack of rock now called the Hillary Step. Shortly afterward, at 11:30 a.m., they step onto the summit. Later as they descend to Camp IV, their teammates come out to greet them, breaking “into a shambling trot with a look of unbelievable hope on their faces,” Hillary writes. Taking fluids (below), they recount their success to fellow climbers.





CHARTING THE ASSAULT ON EVEREST

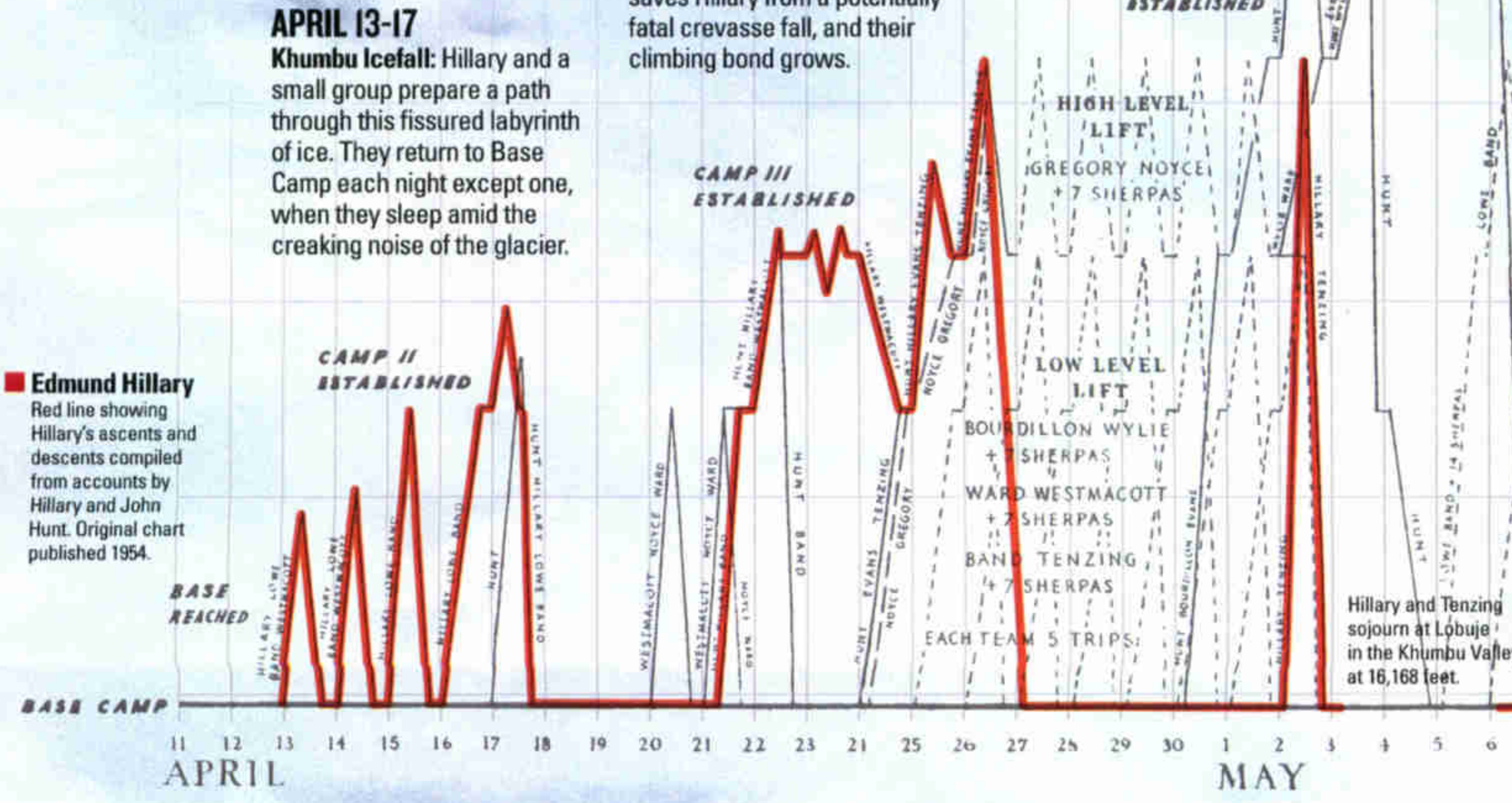
The siege of Everest took weeks of ups and downs as the men broke trail and ferried supplies to camps ever higher on the peak. By the time Hillary and Tenzing finally stood on the summit, Hillary had effectively climbed the mountain three and a half times.



1953

April 13-June 3: The team that moved a mountain

A jubilant Everest expedition poses with the high-altitude Sherpas (seated) after the ascent. Leader John Hunt (sixth from left) said teamwork was the key. "Everyone rightly believed," he wrote, "that he had a vital part to play in getting at least two members of the team on top."



APRIL 13-17

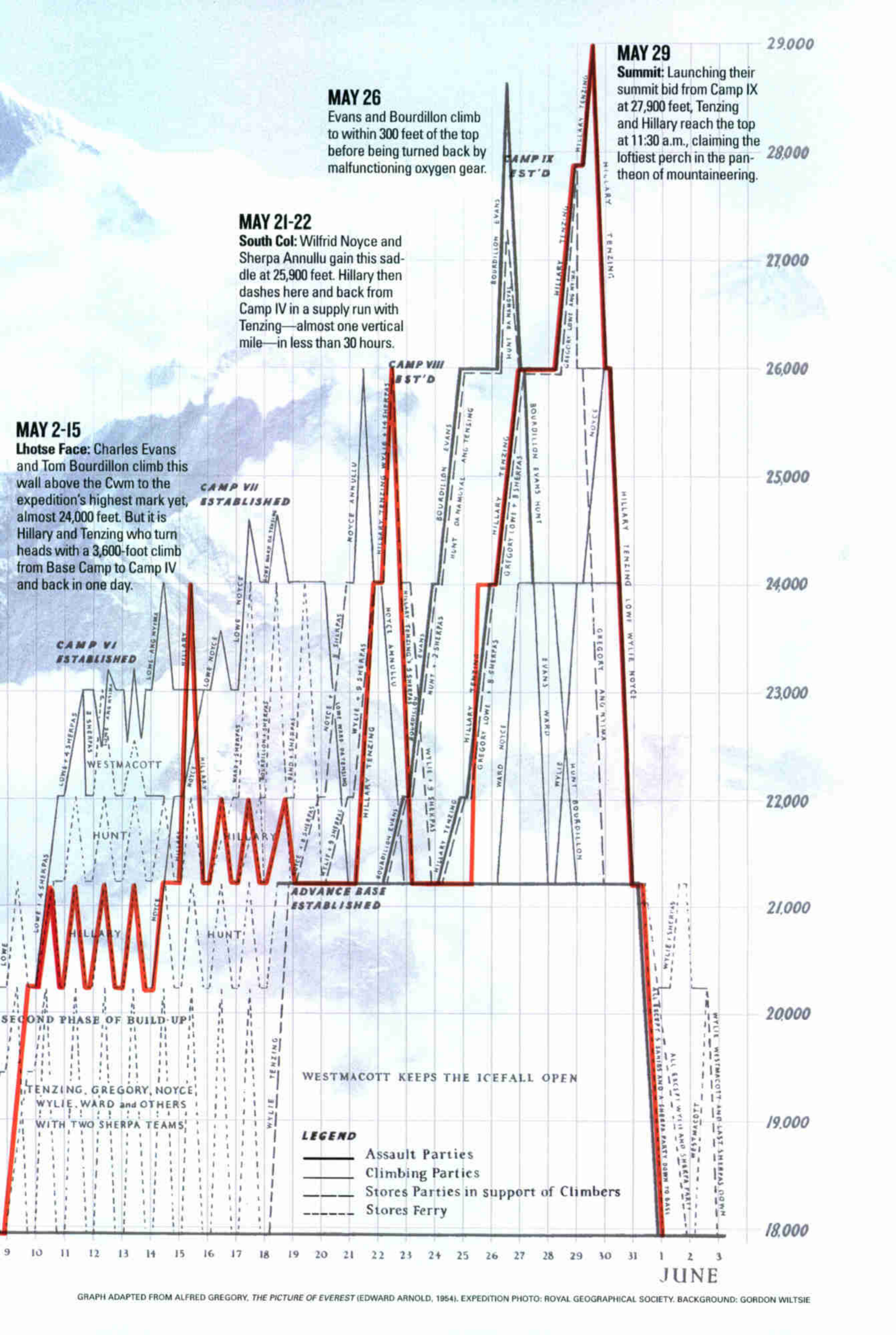
Khumbu Icefall: Hillary and a small group prepare a path through this fissured labyrinth of ice. They return to Base Camp each night except one, when they sleep amid the creaking noise of the glacier.

APRIL 18-MAY 2

Western Cwm: The men ferry 1.5 tons of supplies up to the Cwm (a Welsh word for valley, pronounced koom). Tenzing saves Hillary from a potentially fatal crevasse fall, and their climbing bond grows.

■ Edmund Hillary
Red line showing Hillary's ascents and descents compiled from accounts by Hillary and John Hunt. Original chart published 1954.

Hillary and Tenzing sojourn at Lobju in the Khumbu Valley at 16,168 feet.



MAY 2-15

Lhotse Face: Charles Evans and Tom Bourdillon climb this wall above the Cwm to the expedition's highest mark yet, almost 24,000 feet. But it is Hillary and Tenzing who turn heads with a 3,600-foot climb from Base Camp to Camp IV and back in one day.

MAY 21-22

South Col: Wilfrid Noyce and Sherpa Annullu gain this saddle at 25,900 feet. Hillary then dashes here and back from Camp IV in a supply run with Tenzing—almost one vertical mile—in less than 30 hours.

MAY 26

Evans and Bourdillon climb to within 300 feet of the top before being turned back by malfunctioning oxygen gear.

MAY 29

Summit: Launching their summit bid from Camp IX at 27,900 feet, Tenzing and Hillary reach the top at 11:30 a.m., claiming the loftiest perch in the pantheon of mountaineering.

ADVANCE BASE ESTABLISHED

CAMP VII ESTABLISHED

CAMP VI ESTABLISHED

CAMP IX EST'D

CAMP VIII EST'D

WESTMACOTT KEEPS THE ICEFALL OPEN

LEGEND

- Assault Parties
- Climbing Parties
- - - Stores Parties in support of Climbers
- · · Stores Ferry

JUNE

1960-61

September-May: Research on the human body's limits

Led by Edmund Hillary, an international party of scientists and climbers spends eight months in the Himalaya at elevations up to 18,765 feet to study the body at high altitude. NATIONAL GEOGRAPHIC writer and photographer Barry Bishop pedals a stationary bike (below) near 15,000 feet to generate pulmonary and cardiac data. Without oxygen the expedition later assaults Makalu (right), the world's fifth highest peak, but fails 370 feet from the top.



ABOVE: THOMAS O. NEVISON
RIGHT: JOHN HARRISON



“THE WIND WHIPS AND TEARS AT US
AS WE PERCH PRECARIOUSLY ON EARTH’S
HIGHEST PINNACLE.” —BARRY BISHOP





1963

May: First Americans reach the summit

A massive spring expedition sponsored in part by the National Geographic Society requires more than 900 porters (above) to carry 27 tons of supplies to Base Camp in Nepal. On May 1 two climbers reach the top; on May 22 four more do, including Bishop (far left). He pays a price: frostbite (below) requires amputation of all ten toes. Earlier a block of ice in the Khumbu Icefall (left) had collapsed, killing climber John Breitenbach.



LEFT: LUTHER O. JERSTAD. TOP AND BOTTOM: BARRY C. BISHOP. INSET: LISA M. BISHOP

“I SHOULD TAKE SOME MORE PICTURES BUT I CANNOT... I MUST GET BACK DOWN. HALF AN HOUR TOO LATE MEANS THE END OF ME.” —REINHOLD MESSNER



1975
May 16: First woman reaches the summit

Junko Tabei exults on the shoulders of Sherpa Ang Tshering after climbing Everest. Earlier in the all-women expedition an avalanche had swallowed this Japanese mother of a three-year-old girl. Sherpas had spotted her ankle above the snow and rescued her. Twelve days later she summits, her broken glasses held fast with rubber bands. “There are many beautiful and mysterious places,” she says. “I have been lucky to have visited mountains throughout my life.”



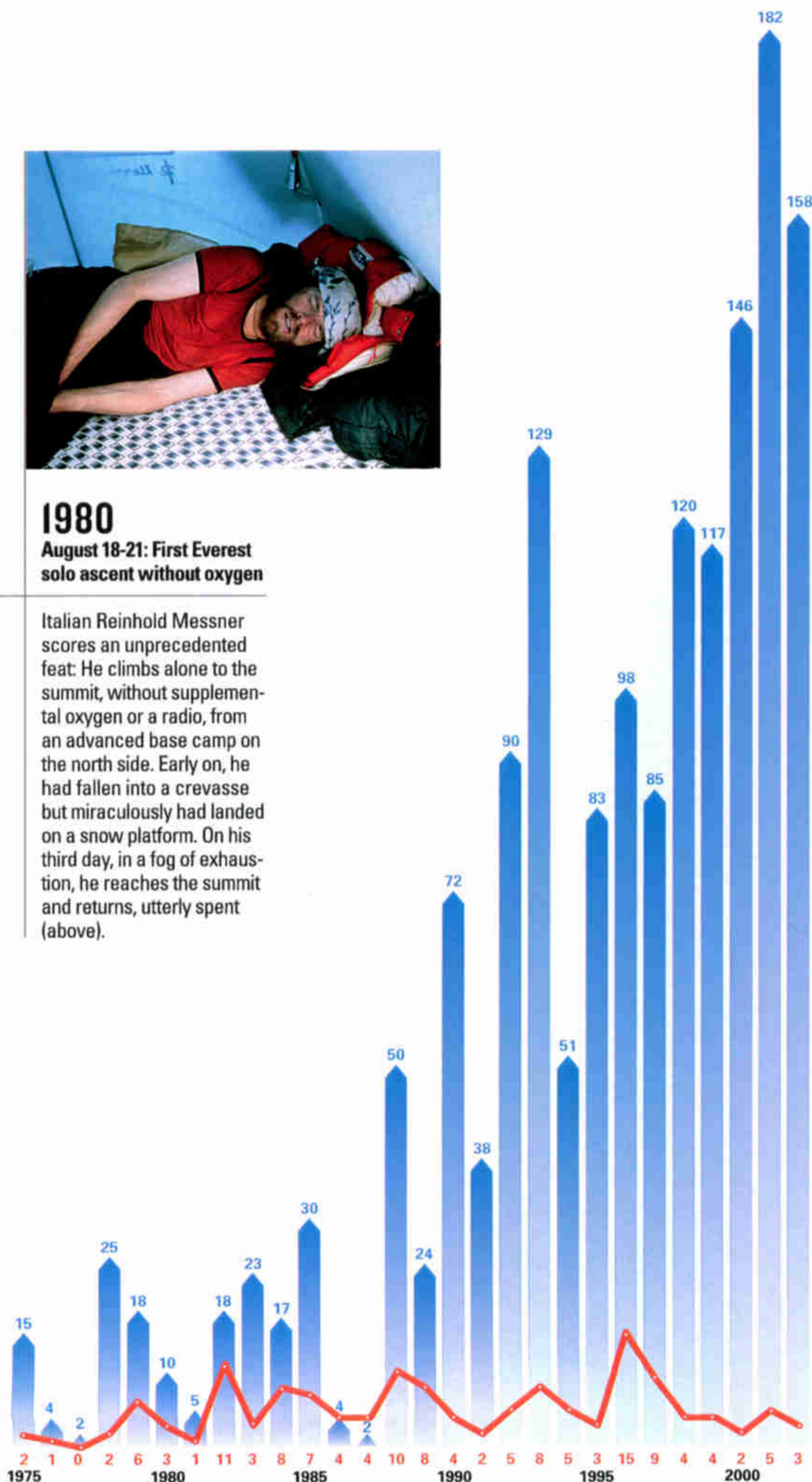
1980
August 18-21: First Everest solo ascent without oxygen

Italian Reinhold Messner scores an unprecedented feat: He climbs alone to the summit, without supplemental oxygen or a radio, from an advanced base camp on the north side. Early on, he had fallen into a crevasse but miraculously had landed on a snow platform. On his third day, in a fog of exhaustion, he reaches the summit and returns, utterly spent (above).

PEAK TRAFFIC

Life and death on Everest: Since 1975, Mount Everest has been climbed more than 1,600 times by some 1,200 individuals, ages 16 to 65, including 75 women. A record 89 climbers summited on one day: May 23, 2001. Everest has claimed the lives of 175 people.

■ Summits
■ Fatalities





1983

September-October: First ascent of the East Face

An American team, equipped with rockets to launch ropes for hauling gear, summits from Tibet via the East, or Kangshung, Face. Sixty years earlier Mallory had deemed the route impossible, with its 3,500-foot vertical rock buttress topped by 7,700 feet of avalanche-prone slopes. Pinsetter Camp clings to the buttress above a gully nicknamed the Bowling Alley for the chunks of rock and ice that tumble past the team. A total of six climbers summit on October 8 and 9.



WEBSITE EXCLUSIVE

Relive the first American summit and check out climber Barry Bishop's 1963 story. Then watch President John F. Kennedy award the Geographic's Hubbard Medal to the American team. The event took place in the Rose Garden shortly before his assassination. All at nationalgeographic.com/ngm/0305.

“I WAS CONFIDENT I COULD DO AS WELL AS ANYONE ELSE WHO GOES TO THAT MOUNTAIN. AND I KNEW I COULD TURN BACK GRACEFULLY IF NECESSARY.” —ERIK WEIHENMAYER

1996

Everest's worst death toll for a single year

Fifteen climbers die this year, eight in a storm on May 10 and 11 that traps three groups near the summit. Just after midday on the 10th, guide Anatoli Boukreev (left) takes the lead toward the Hillary Step in a steady gale that heralds the coming tempest. The tragedy underscores old risks in a new trend—clients lacking solid Himalayan climbing experience who pay for an escort to the top.

2000

October 7: First complete ski descent of Everest

Slovenian Davo Karnicar (below left, approaching 23,000 feet) becomes the first to ski uninterrupted from summit to Base Camp. He drops more than two vertical miles in less than five hours without removing his skis, thanks to clear skies and thick snow cover on the Hillary Step. “Good weather is the key to a ski descent of Everest,” he said, citing two fingers lost to frostbite during his 1996 attempt.

2001

May 25: First blind person to the top

Led by close friends, and roped, Erik Weihenmayer jumps crevasses to reach the summit.



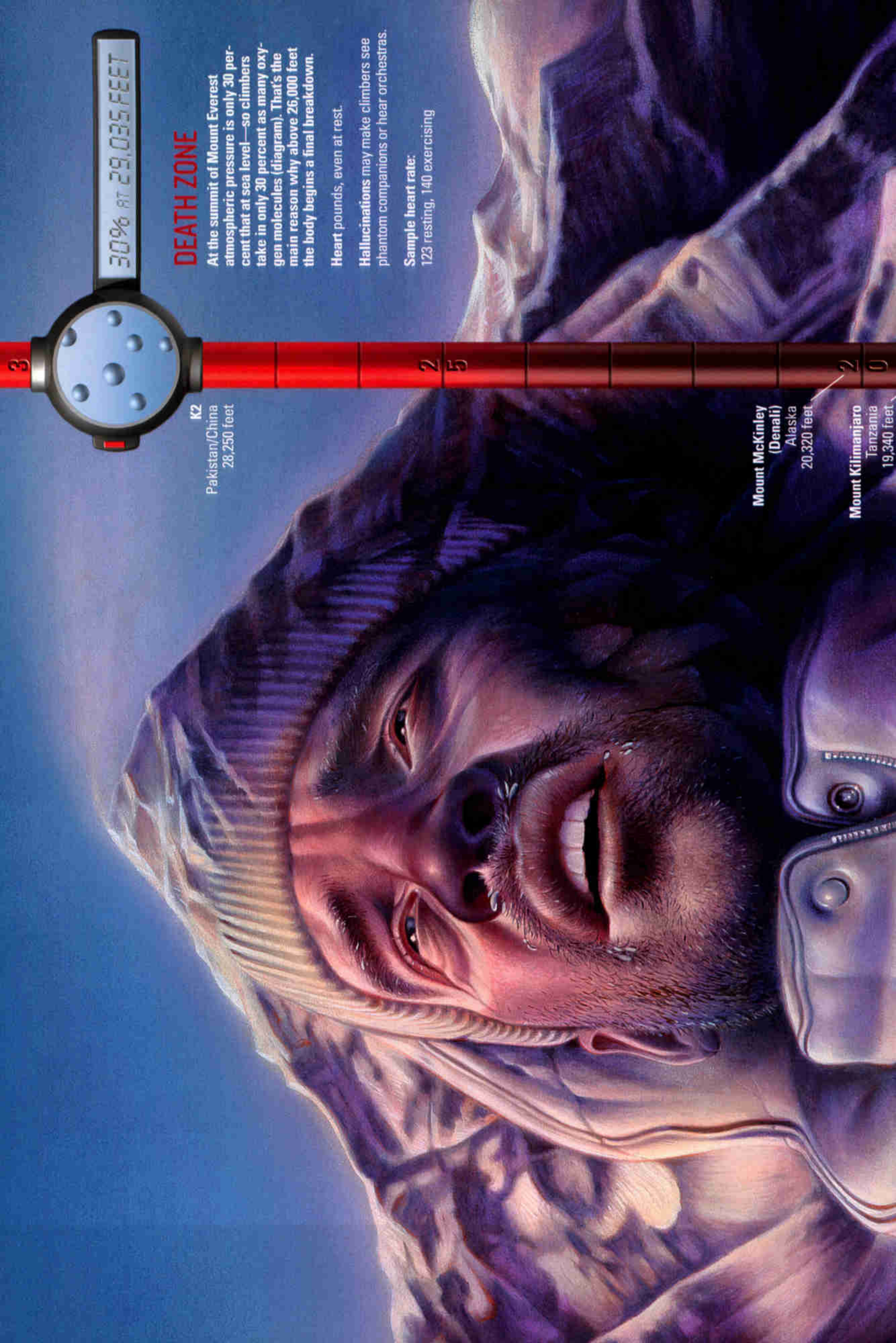
2002

May 25: 50th Anniversary Everest Expedition summits

Celebrating atop Everest with Dawa Sherpa, Brent Bishop (below, at right) and Peter Hillary honor their fathers Barry and Edmund on a tribute climb sponsored by the National Geographic Society. Jamling Norgay, son of Tenzing, supports them from Base Camp. “We were privileged to take part,” says Bishop. “Knowing what our dads did long ago, we had a feeling of awe and admiration.” □



LEFT: NEAL BIEDLEMAN, WOODFIN CAMP. ABOVE: URBAN GOLOB. CENTER: TIME PIX. RIGHT: BRENT BISHOP



30% AT 29,035 FEET

DEATH ZONE

At the summit of Mount Everest atmospheric pressure is only 30 percent that at sea level—so climbers take in only 30 percent as many oxygen molecules (diagram). That's the main reason why above 26,000 feet the body begins a final breakdown.

Heart pounds, even at rest.

Hallucinations may make climbers see phantom companions or hear orchestras.

Sample heart rate:
123 resting, 140 exercising

K2
Pakistan/China
28,250 feet

Mount McKinley (Denali)
Alaska
20,320 feet

Mount Kilimanjaro
Tanzania
19,340 feet

THE KILLER WITHIN

Edema, the accumulation of excess fluid in the body, frequently can be a lethal threat to the brain or lungs of climbers at extreme altitude. "I can honestly say I've never gone to Everest without seeing someone suffer from cerebral or pulmonary edema," says Ken Kamler, a physician who has attempted the peak four times. Cerebral edema occurs when plasma leaks through capillary walls, driving up pressure inside the skull. Scientists still don't fully understand the cellular and chemical reasons why brain capillaries leak, but they have identified three suspects: The separation of normally

tight junctions between cells lining the blood vessels, inflammation of the vessels themselves, or a chemical called vascular endothelial growth factor, which stimulates new capillary growth in low-oxygen conditions.

In the lungs, constriction of blood vessels leads to pulmonary edema. The squeezing creates high pressure in delicate lung capillaries, which then leak fluid that drowns the victim in his own secretions. Only recently has constriction been confirmed as the cause of pulmonary edema, refuting old theories focusing on inflammation or heart failure.

50% AT 18,000 FEET

CIVILIZATION STOPS

There are no permanent settlements above this point anywhere on Earth because no one can adjust year-round to the altitude.

Lungs expel more carbon dioxide, disrupting the blood's pH balance.

Kidneys discharge more water to correct the blood's acidity, causing dehydration.

Sample heart rate:
85 resting, 140 exercising

La Rinconada —
Peru
16,730 feet
(highest permanent human habitation)

Mont Blanc —
Italy/France
15,771 feet

Mount Rainier —
Washington
14,409 feet

Mount Fuji —
Japan
12,388 feet

La Paz —
Bolivia
11,483 feet

75% AT 9,000 FEET

GULPING AIR

By this altitude nearly everyone feels the impact of the thin air.

Respiration speeds and deepens as the body senses less oxygen in the blood.

Brain swells slightly, causing headache and nausea.

Kidneys increase hormone that triggers production of more red blood cells.

Sample heart rate:
70 resting, 155 exercising

Vail
Colorado
8,200 feet



CEREBRAL EDEMA

This magnetic resonance image shows a cross section of the brain of a 33-year-old man suffering from cerebral edema shortly after his evacuation from Mount McKinley, Alaska. (He made a full recovery.) The bright white shapes at the center of the brain are cerebral ventricles. In front of and behind the ventricles lie areas of tissue swollen with leaked fluid (false-colored in red). Exactly where the fluid collects depends on the root cause of the problem. A stroke, for example, can lead to fluid within brain cells. But researchers have produced compelling evidence that high altitude causes leakage from capillaries rather than swollen cells.



PULMONARY EDEMA

This chest x-ray of a 31-year-old male skier evacuated from a mountain in Colorado illustrates pulmonary edema. (He also survived.) On either side of his heart the red-colored foggy areas show fluid leaking from capillaries around some of the lungs' 300 million alveoli, or air sacs. Oxygen absorption into the blood is inhibited when these capillaries leak under pressure from constricting pulmonary blood vessels. Nitric oxide, a chemical that dilates blood vessels, is produced by the body and can also be administered to treat pulmonary edema. Recent research suggests that susceptibility to pulmonary edema may be linked to an inability to produce enough nitric oxide.

100% AT SEA LEVEL

The Body

ADJUST OR DIE

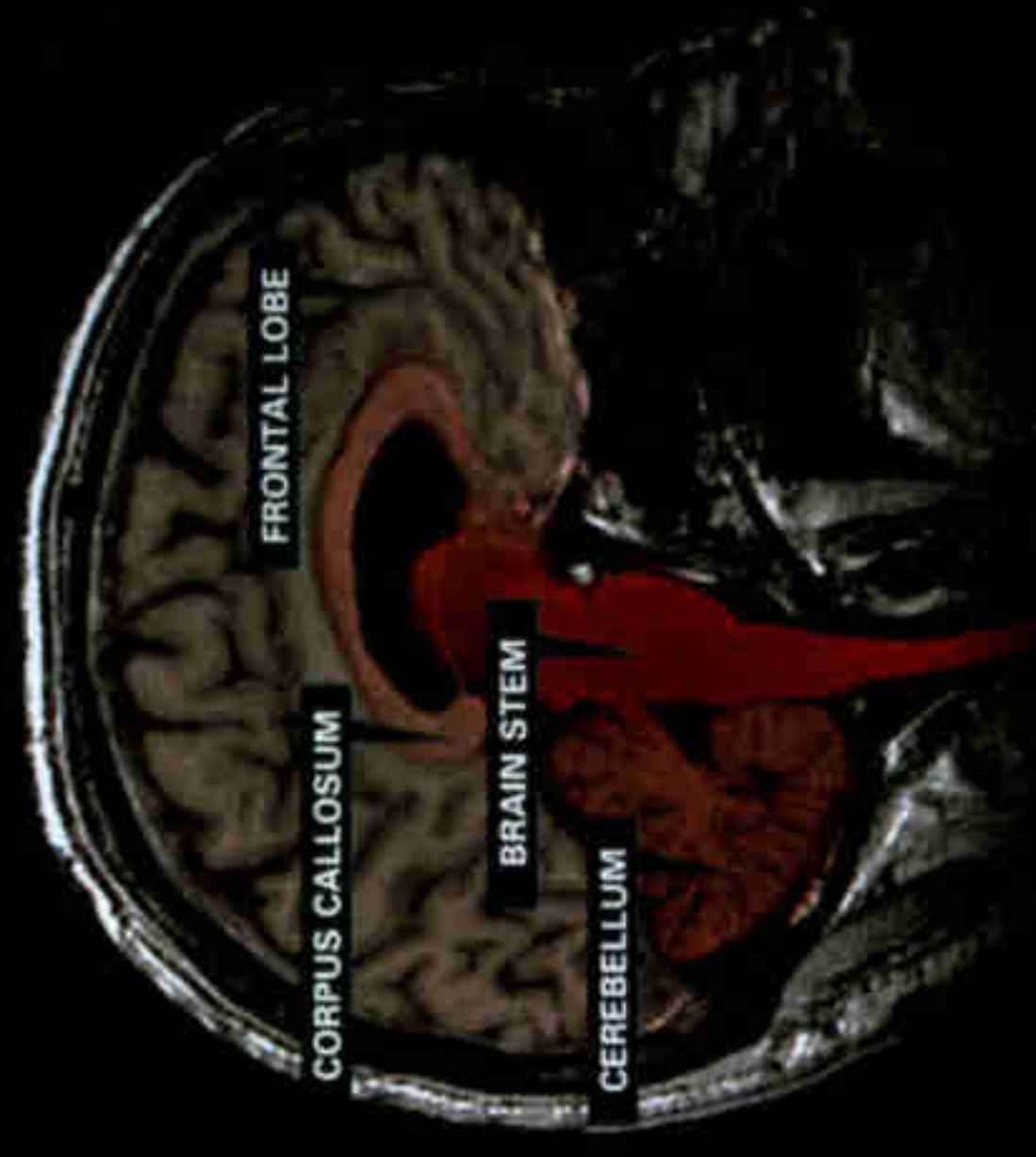
BY MICHAEL KLESIUS NATIONAL GEOGRAPHIC WRITER

"I am nothing more than a single, narrow, gasping lung, floating over the mists and the summits." So wrote Reinhold Messner of his moments atop Mount Everest in 1978, when he and Peter Habeler stunned the climbing world by becoming the first to scale the peak without bottled oxygen. Today 90 climbers have repeated the feat—extraordinary, given that an unacclimated person taken from sea level directly to the summit, five and a half vertical miles, would pass out in about three minutes and die in roughly ten more from lack of oxygen.

"Everest is climbable over time," says Rob Roach, an altitude physiologist. "You can, however, torture yourself on many levels by trying to climb it." Frostbite is always a hazard on a mountain where the temperatures often plunge to single digits and winds can exceed 90 miles an hour. Dehydration can beset a climber, who exhales more than a gallon of moisture a day

in the parched air. Pulmonary or cerebral edema can strike quickly, often fatally. And temporary blindness results when the brain's visual cortex doesn't get enough oxygen. Ultraviolet radiation, which strengthens by 4 percent per thousand feet, can also damage corneas. Any of these ills can lead to falls, cause of the greatest number of deaths on Everest. Climbers can acclimatize by gradually training at higher altitudes in thinner air. Recent studies show that some people are born with a gift for adjusting, while others have genes that predispose them to breathing problems up high. Altitude physiologists remain baffled why some adjust easily and others not at all.

► **WEBSITE EXCLUSIVE:** Listen to America's premier mountaineer—conqueror of 12 of the world's 14 highest peaks—describe the physical effects of climbing to the extreme at nationalgeo.com/ngm/0305.



A FRAGILE ORGAN

"The brain is a sentinel," says altitude physiologist Peter Hackett, who has summited Everest. "It's the organ most sensitive to environmental changes." Accounting for only 2 percent of an adult's body weight, the brain burns up to 15 percent of the body's oxygen. This view of a healthy brain shows areas that fail under low oxygen. Impaired memory and reasoning signal a neurotransmitter dysfunction in the frontal lobe. Plasma leakage from the corpus callosum, a risk at altitude, creates internal pressure. A staggering gait suggests that this pressure has affected the cerebellum, site for balance control. Coma and death can follow with further stress on the brain stem.

50 YEARS

The Hero

BY PETER MILLER SENIOR EDITOR

A few days after his triumphant ascent of Mount Everest with Tenzing Norgay, Ed Hillary received word that Queen Elizabeth planned to make him Sir Edmund. He was taken aback. "Oh, I found it difficult," he recalls now. "I didn't feel I was the ideal

sort of person who should have a title." For one thing, he couldn't see strolling around his hometown of Papakura, New Zealand, in his old work clothes, a knight commander of the Order of the British Empire. "My God," he remembers saying to himself, "I'll have to buy a new pair of overalls."

Here was a new kind of hero, a tall, rangy beekeeper from the fringes of the empire. One of only two Kiwis on the 1953 Everest expedition—his pal George Lowe was the other—he may have lacked the social graces of his eight English climbing partners. But he more than made up for it with strength and tenacity. Having learned to climb in New Zealand's Southern Alps in the winter (the off-season for bees), Hillary was as bold on ice and snow as anyone on the team. And he and Tenzing had made it to the top.

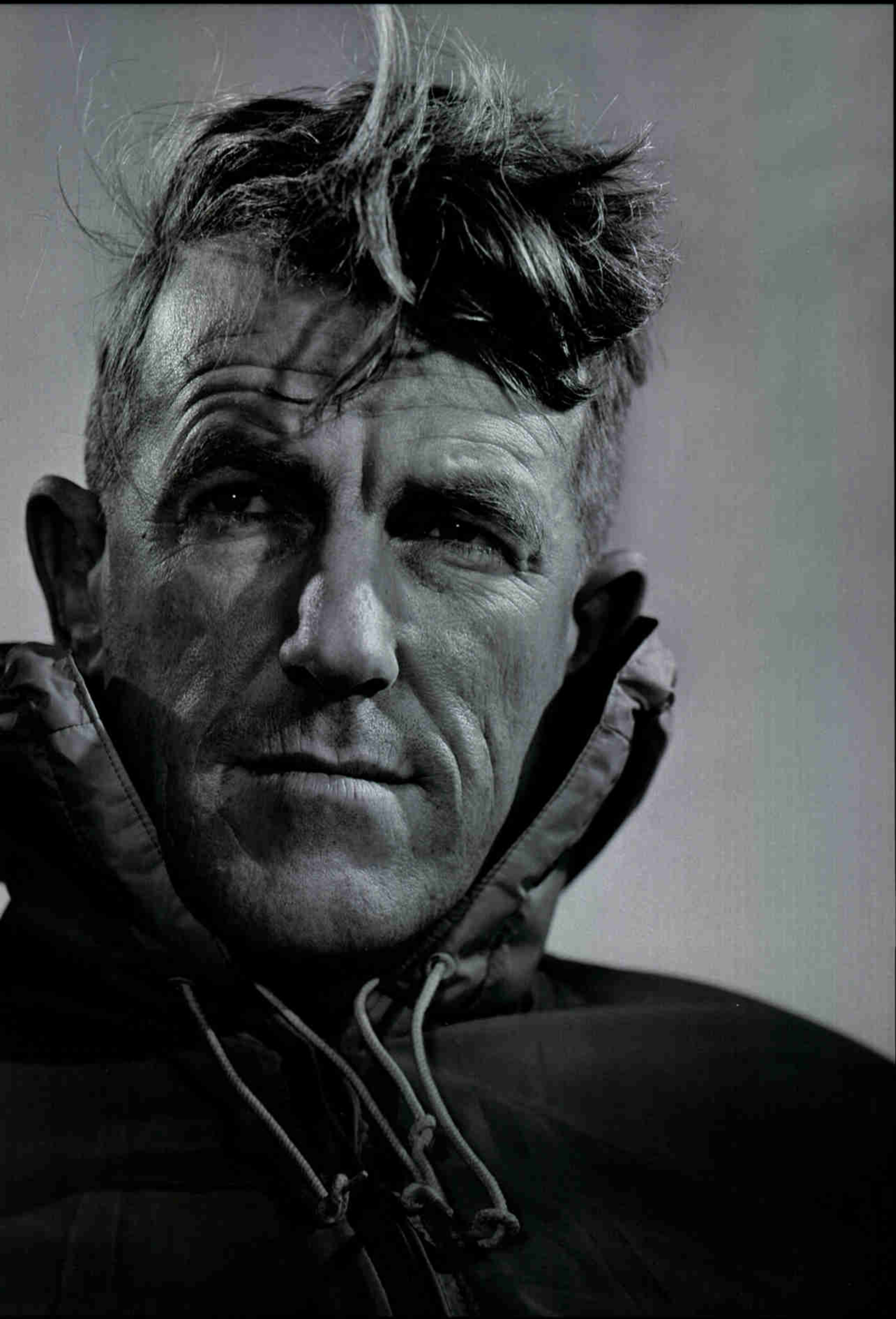
Ed's younger brother, Rex, with whom he shared the beekeeping business, met him in London for the July ceremony at which Ed, Tenzing, and Col. John Hunt, the expedition leader, were to be honored. It followed a garden party at Buckingham Palace, where 7,500 guests in summer frocks and morning coats huddled under umbrellas in the rain. "We were ushered into this room by the staff," Rex remembers. "They were probably lords and ladies and God-knows-what. Then the Queen came in. She was very young and pretty in those days." Ed knelt on a stool, Elizabeth touched him lightly on both shoulders with a small sword and said, "Arise, Sir Edmund." Staying in Britain for weeks of champagne toasts, Hillary was introduced to his first hangover.

Flush with the glow of celebrity, the newly knighted climber stopped off in Sydney on his way back to Auckland to court his future wife, Louise Rose, who was studying at the Sydney Conservatorium of Music. He balked at asking for her hand, however. "I was certainly not a ladies' man," he admits. "I was just terrified at the thought of proposing. Fortunately, my future mother-in-law was a very strong lady, and she didn't have any qualms about bringing it up with Louise." So the conqueror of Everest took a backseat while Louise's mother popped the question to her over the telephone from their home in Auckland.

In the years that followed, Hillary led expeditions on first

MODEST ADVENTURER

As a climber, Edmund Hillary had been well prepared for Mount Everest. But celebrity took him by surprise. "I felt the mountaineering community would be quite interested by our success," he says, "but I didn't have any concept of the reaction from the media and from the general public." Moved by a sense of kinship with the Sherpa people, who live near Everest, Hillary later uses his famous name to finance projects for their benefit.



ascents of several Himalayan peaks, including Baruntse (23,517 feet), Chago (22,615 feet), and Pethangtse (22,106 feet), drove modified farm tractors to the South Pole in support of a British scientific party crossing Antarctica, went in search of the mythical yeti in Nepal, and wrote books about his adventures. Having given up beekeeping, he signed on as a camping consultant to Sears in 1963, testing new tent designs on vacations with Louise and their three kids, Peter, Sarah, and the youngest, Belinda.

Catastrophe struck in 1975, when a small plane carrying Louise and Belinda crashed and burned shortly after takeoff from Kathmandu. The two were on their way to join Sir Edmund in the village of Phaphlu, where he and Rex were building a hospital with local Sherpas and volunteers. "Ed was thunderstruck," says Rex. "It was so damn sad." It took many years for Sir Edmund to recover, but he took some comfort in the physical labor of his aid projects in the Everest region.

Those projects—to build schools, hospitals, bridges, and other improvements in Sherpa villages—grew out of Hillary's affection for the mountain people. "Ed's the sort of person who, if he's asked to do something and he can't think of a reason not to, he'll go ahead and do it," says Jim Wilson, a longtime friend from New Zealand. To help fund this private aid program, Hillary and several buddies created the Himalayan Trust, which continues to this day.

In 1989, at the age of 70, Sir Edmund married June Mulgrew. Today many Sherpas in the Everest region consider them both to be part of their families. A few years ago at a banquet in the village of Khumjung, Sir Edmund told his Sherpa friends that for June and him, coming back was like coming home. "When he said that, all the old people had tears in their eyes," says lifelong resident Doma Chamji, in part because they knew Hillary was increasingly sensitive to altitude. Each visit to the village at 12,300 feet might be his last.

Even now, at 83, with his trademark bushy eyebrows, white sideburns, and longish flyaway hair, Sir Edmund is still frequently called upon to be the hero of Everest—whether he's cutting an Everest-shaped cake at the Auckland Museum or giving a pep talk to New Zealand's national rugby team, the All Blacks. "The thing that amazes me, in a way, is that it all keeps going," he says. "But I think I have a clear idea why. I think a lot of people rather like the fact that I haven't just climbed mountains but also built schools, hospitals, and all the rest of it. So in a way I've given back to the people all the help they gave me on the mountain."

On May 25, 2002, Sir Edmund got a telephone call from his son. "Dad, it's Peter. We're on the summit," he said from Mount Everest. The 47-year-old was part of a National Geographic expedition commemorating the 50th anniversary of the 1953 climb, including Jamling Norgay, Tenzing's son, and Brent Bishop, son of Barry Bishop, a member of the first American team to reach the top, in 1963. "Well, take it easy on the way down," Sir Edmund cautioned. They chatted briefly about the weather. Then it was time for Peter to go. "I feel really emotional about being up here," he said. "What you did nearly 50 years ago—it's just incredible."

It was a feeling many would endorse, because Sir Edmund has proved during a lifetime of generosity and achievement that he is more than a new kind of hero. He is one of a kind. □

FAMILY SCRAPBOOK

A jubilant crowd at the Auckland waterfront (1) awaits Hillary and fellow Kiwi George Lowe (3) on their triumphant return to New Zealand in August 1953.

Baby Edmund (5), born on July 20, 1919, is the second of three children of Gertrude and Percy Hillary (2), seen at their wedding on February 9, 1916. (Sir Edmund's sister, June, and brother, Rex, still live near him in suburban Auckland.)

A self-described "poor country boy," Ed learns to climb in New Zealand's Southern Alps, where in 1948 he makes a first ascent of the South Ridge of Mount Cook (7) with Harry Ayres.

With his first wife, Louise, Hillary has three children: Peter, Sarah, and Belinda. Seen at home with young Peter in Auckland (6), Hillary travels extensively on lecture tours and new expeditions. Louise, holding Peter and infant Sarah (8) in a 1956 snapshot, had been "pure magic," say friends. She is killed with Belinda in a plane crash outside Kathmandu in 1975.

Sir Edmund remarries at age 70 in 1989, wedding June Mulgrew, the widow of a former expedition partner. They appear together in 1986 on the Auckland TV show, *This Is Your Life* (4).



SIR EDMUND HILLARY, AUCKLAND MUSEUM



50 YEARS

MyStory

BY SIR EDMUND HILLARY

Ever since the morning of May 29, 1953, when Tenzing Norgay and I became the first climbers to step onto the summit of Mount Everest, I've been called a great adventurer. The truth is, I'm just a rough old New Zealander who has enjoyed many challenges in his life. In fact, as I look back after 50 years, getting to the top of Everest seems less important, in many ways, than other steps I've taken along the way—steps to improve the lives of my Sherpa friends in Nepal and to protect the culture and beauty of the Himalaya.

Not that I wasn't excited to reach the top of the world. I remember when Tenzing and I faced the icy, narrow final ridge to the summit. Some on our team had predicted the ridge would be impossible to climb, but it didn't look so bad to us. After attaching fresh oxygen bottles to our masks, we set off. I led the way, hacking a line of steps with my ice ax. After about an hour we came to a 40-foot-high rock buttress barring our path—quite a problem at nearly 29,000 feet. An ice cornice was overhanging the rock on the right with a long crack inside it. Beneath the cornice the mountain fell away at least 10,000 feet to the Kangshung Glacier. Would the cornice hold if I tried to go up? There was only one way to find out.

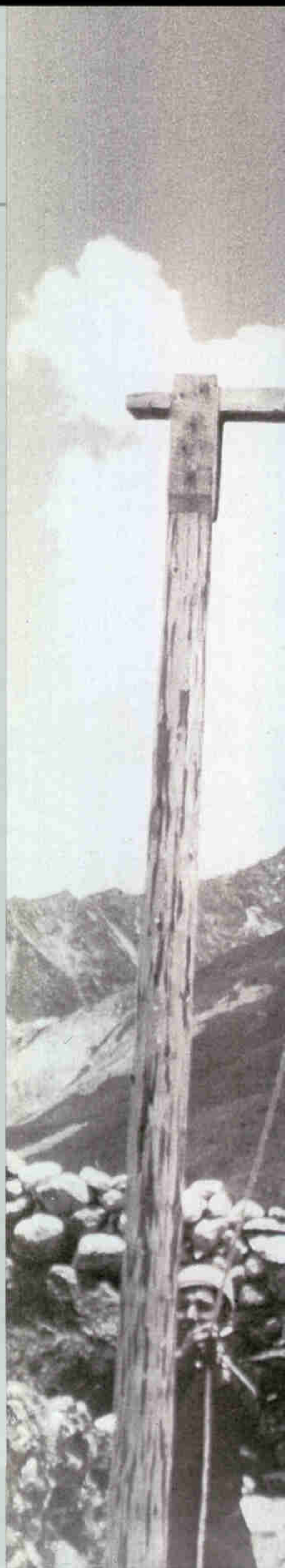
Jamming my crampons into the ice behind me, I somehow wriggled my way to the top of the crack, using every handhold I could find. For the first time I felt confident that we were going to make it all the way. To the right I saw a rounded snow dome and kept cutting steps upward. In less than an hour I reached the crest of the ridge, with nothing but space in every direction. Tenzing joined me, and to our great delight and relief we stood on top of Mount Everest.

In the years that followed our climb, I returned many times to the Everest region with my mountaineering friends and built up a close relationship with the Sherpas, spending a great deal of time in their homes and with their families. I admired their courage and strength, but I quickly realized that there were many things they lacked in their society that we just took for granted back in New Zealand such as schools or medical facilities.

One day in 1960 our group of climbers and Sherpas was camped on a glacier not far from Everest. Shivering in the cold, we huddled

GIVING BACK

"I was brought up to believe that if you had a chance to help people worse off than you, then you should do it," Hillary says of his aid projects in Sherpa villages. "Plus I really enjoyed the work." Putting up a school in Pangboche in 1963, Hillary (right) and his climbing companions also vaccinate hundreds of Sherpas against smallpox, then raging through rural Nepal. Over the years, he helps build hospitals, water systems, bridges, and schools.





around a smoky scrub fire. For hours we had been talking about the fortunes of the Sherpa people in a mix of Nepali and English. The flames sank lower, and the cold crept in around us. A Sherpa by the name of Urkien tossed a handful of stunted azalea on the fire, making it flare with a crackle of sparks.

"Tell us, Urkien," I said. "If there were one thing we could do for your village, what should it be?"

"We would like our children to go to school, sahib!" he said. "Of all the things you have, learning is the one we most desire for our children."

Urkien's words hit home. The next year I persuaded a company in Calcutta to donate a prefabricated aluminum building. The Swiss Red Cross flew the building in parts from Kathmandu to a mountain airstrip at 15,500 feet in the Mingbo Valley. From there the Sherpas carried the building materials a day's march to Khumjung, and we constructed the school.

We invited the head lama of Tengboche monastery to carry out the opening ceremony in June 1961. He arrived with a number of monks who brought trumpets, drums, and cymbals. There was much chanting of prayers, and finally the head lama circled the building twice with us all trailing along behind him. As he went, he cast handfuls of rice in every direction. Khumjung's school was duly blessed.

As I got older, my wife, June, and I traveled around the world, raising funds for new projects for the Himalayan people. At the request of Sherpa residents, we helped establish 27 schools, two hospitals, and a dozen medical clinics—plus quite a few bridges over wild rivers. We constructed several airfields and rebuilt Buddhist monasteries and cultural centers. We planted a million seedlings in Sagarmatha National Park to replace the vast number of trees destroyed for firewood and used to build the small hotels that came with the growth of tourism.

So over the years I've done lots of expeditions and projects in remote parts of the world—some big ones and many small ones. I've stood at both the North and South Poles as well as on the world's highest peak. When I look back over my life, though, I have little doubt that the most worthwhile things I have done have not been getting to the summits of great mountains or to the extremes of the Earth. My most important projects have been the building and maintaining of schools and medical clinics for my dear friends in the Himalaya and helping restore their beautiful monasteries too.

I clearly remember the happy day when we first opened the Khumjung school with only 47 children in scruffy Sherpa clothes—but with rosy cheeks and beaming smiles. Now one of them is a pilot of a Boeing 767 and others are important executives in travel, business, and nonprofit organizations.

These are the memories I will carry with me always. □

FRIEND IN HIGH PLACES

Accepting the blessings of villagers, Hillary wears a mountain of scarves at a 1990 party in Khumjung, where three decades earlier he first built a school in the Everest region. "If we hadn't gone to the school, we would still be yak herders," says Ang Rita Sherpa, who now administers Hillary's foundation in Kathmandu. Teacher Pasang Sherpa puts it simply: "Hillary is a man with a big heart."

WEBSITE EXCLUSIVE

Enjoy the Sights & Sounds of Sir Edmund Hillary's life—from the top of Everest to his work among the Sherpas—and find out how you can help at nationalgeographic.com/ngm/0305.







The

Tough, amiable, and business savvy, the people of Nepal's Khumbu region have gotten rich from high-altitude tourism, shepherding trekkers through their homeland step by tortuous step. Now some wonder if their success has come at too high a price.



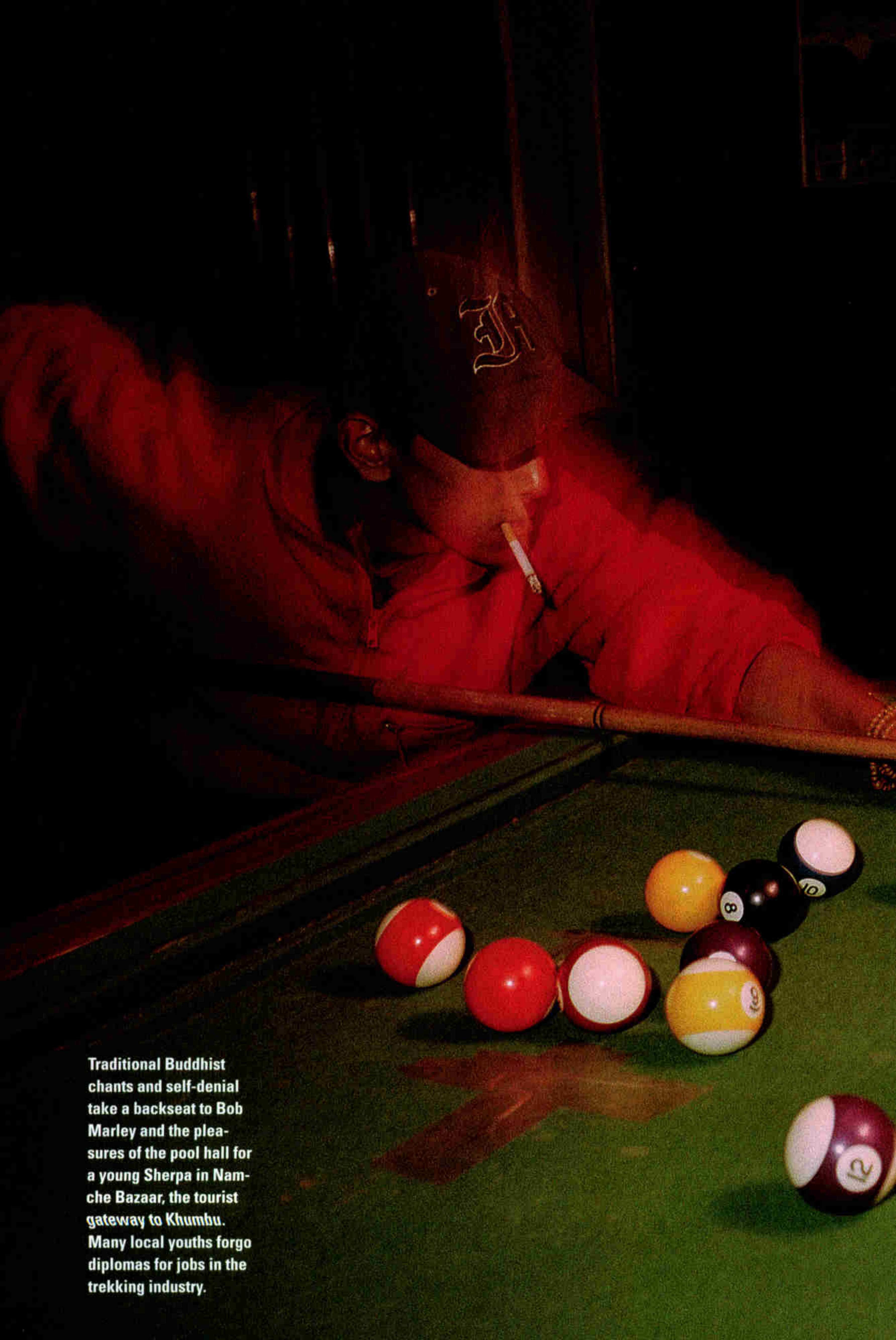
Sherpas

BY T. R. REID
PHOTOGRAPHS BY
ROBB KENDRICK

Decorum demands the correct headgear for the summer festival of Dumje, one of the Sherpas' most elaborate ceremonies. Buddhist monks don saffron-hued *tse-sha* while laymen favor cowboy-style hats introduced by tourists.





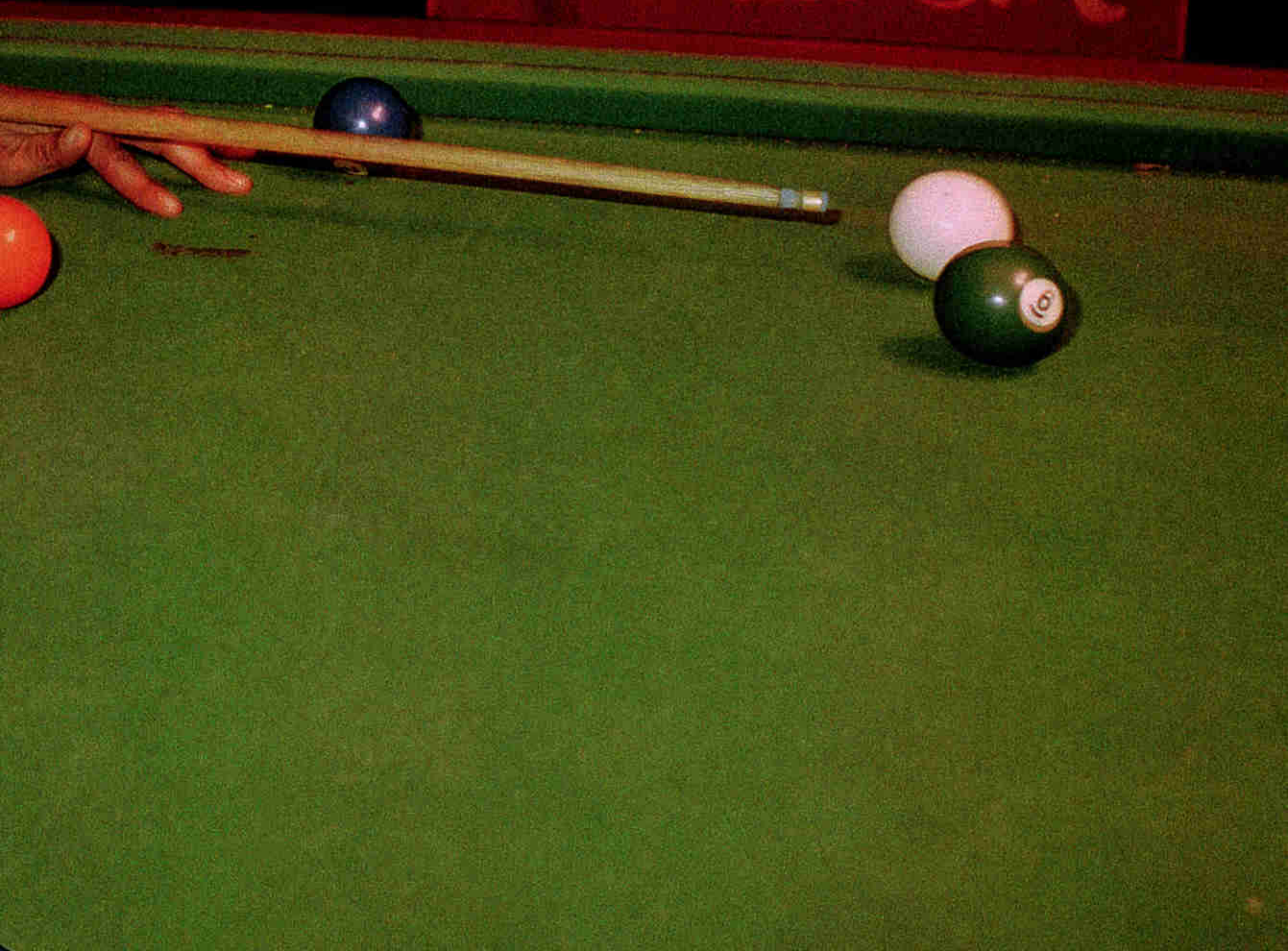


Traditional Buddhist chants and self-denial take a backseat to Bob Marley and the pleasures of the pool hall for a young Sherpa in Namche Bazaar, the tourist gateway to Khumbu. Many local youths forgo diplomas for jobs in the trekking industry.

DUB MARLEY
DUB MARLEY



FREEDOM



A woman in a traditional Sherpa dress is harvesting wheat in a field. She is wearing a brown, long-sleeved tunic and a colorful, patterned shawl. She is holding a large, woven basket filled with harvested wheat. The background shows a field of tall, golden wheat stalks under a clear sky.

While Sherpa men work the trails in the latest high-tech gear, many Sherpa women still harvest wheat and keep house in the traditional *angee* dress they've worn for centuries. But like the men, women now wear running shoes much of the time.





Civil strife holds up foot traffic at the entrance to Sagarmatha National Park as porters and their cargo await inspection. Concern over a civil war with Maoist rebels cut the number of hikers visiting the park by 39 percent last year.





Nearly 30 years after they were first raised, prayer flags fly high over the village of Khunde in memory of Sir Edmund Hillary's first wife, Louise, and their daughter Belinda. They died in a 1975 plane crash en route to join Hillary as he built a clinic for the Sherpas.



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or some strange reason, my vivid stories about walking five miles through the snow to get to school never seem to impress my kids, so from now on I'm going to tell them instead about Lhakpa Sherpa, a student at the high school Sir Edmund Hillary founded in Khumjung, Nepal. Lhakpa hopes to go to college and become a doctor. To make sure he gets there, the 16-year-old walks five hours to school on stony mountain trails each week, much of the trip almost straight up. "In the monsoon, I walk in rain. In winter, I walk in snow. It's always hard." But then, with a Sherpa's talent for finding the bright side, he adds that "going back home is downhill, so it only takes three hours."

Life would be much easier if there were a yellow school bus to take Lhakpa back and forth. But the fundamental fact of life for the Sherpas, an ethnic group of devout Buddhists living in northeastern Nepal, is that there is no bus, no car, no bicycle, and nary an inch of paved road within the 425 square miles that make up the Khumbu valley, the Sherpas'

traditional home beneath Mount Everest. The Sherpas in Khumbu go everywhere on foot, with their property on their backs—or their yaks' backs, if they are rich enough to own the local beasts of burden. If after arriving via a twin-engine puddle jumper at the tiny airstrip in the nearby village of Lukla, you ask a Sherpa how far it is to the imposing mountain monastery at Tengboche, the answer is given not in distance (it's 14 miles) or in altitude (it's 3,300 feet higher up), but rather in time: "Tengboche? You'll get there on the fourth day." It takes most Westerners two days to trek to the nearby market town of Namche Bazaar and about six more days to get to Everest Base Camp.

When a Sherpa family in Khumbu wants to build a new house, much of the structure—from floorboards to corrugated aluminum roofs—must be carried from the lowlands up the rugged trails on somebody's back. With the current yen for Western-style amenities, a toilet and a kitchen sink might move up the mountain as well, in a porter's bamboo basket, sometimes followed by yet another porter lugging a rooftop solar heating tank that will provide the latest fashionable Sherpa luxury: running hot water.

But if walking is the Sherpas' fate, it has also been their fortune. The first ascent of Mount Everest, 50 years ago this month, sparked a tourism

boom that draws more than 20,000 visitors each year to hike amid the planet's tallest peaks. Strong, congenial, and adept at business, Sherpas play a role in the tourist trade rivaled by few indigenous peoples in the world. They serve not only as high-altitude porters for well-heeled mountaineers but also as guides for the larger number of trekkers who explore the region by hiking at altitudes under 18,000 feet, without any technical equipment. Sherpas own most of the 300-plus lodges and hotels and many of the companies that organize the treks.

Playing out their lives on the world's highest stage, winning friends with their warm smiles and calm competence, mountain-climbing Sherpas have become famous. Some scientists believe that Sherpas may be blessed with genetic features that help them thrive two miles or more above sea level. Their lifelong adaptation to low-oxygen conditions makes it easier for them to survive in the thin Himalayan air. They breathe faster and thus can take in more air per minute than lowlanders can.

Because of their reputation as climbers, the Sherpas are surely the best known of the 30 or so ethnic groups that make up the Nepalese population. Hardly anyone below 12,000 feet has ever heard of the Sherpas' neighbors, groups such as the Rais, the Tamangs, or the Magars. But the word "sherpa" is so familiar it has

become a generic term for a faithful assistant, a porter, or a guide. Almost every Sherpa in the trekking business has a story about a client who turned to him and asked, "How long have you been a sherpa?" And Sherpa isn't just an ethnic identification; like other minority groups in Nepal, Sherpas often use their ethnic name as their last name as well.

Most of the 70,000 or so Sherpas in Nepal aren't involved in the climbing or trekking industries. It's mainly in the Khumbu region that tourism has transformed Sherpas' lives in a generation. The influx of Westerners has brought some of the comforts of modern life to the larger villages. In Namche Bazaar, there are pool halls and pizza parlors, CD shops and video rental counters. Tourism has made the Sherpas of Khumbu rich; or at least, considerably richer than most of their neighbors. In Nepal as a whole, where 80 percent of the population are subsistence farmers, per capita income is about \$1,400 a year. Sherpas involved in tourism can average five times as much. One result is that Sherpas now do less of the heavy lifting on the trail. A Sherpa will organize and lead the trek, but the bulky gear is usually carried by a less well paid porter from other local groups, especially the Rais, who come from villages a week's walk to the south.

My friend Nima Nuru Sherpa is one of thousands of Sherpa success stories. When he was born on a tiny Khumbu farm eight years before the first ascent of Everest, his family grew potatoes like everybody else. "You know, raising potatoes is hard work, such hard work, and you don't make much money," Nima says. But by the time he was a teenager in the late sixties, getting into the mountaineering business was every Sherpa boy's dream. "I was a porter. I carried 45 pounds all the way to Camp II on Everest. That's 22,000 feet, without oxygen! I was a hotel waiter. I was a cook. I did everything."

Tireless, bright, and quick to pick up languages, Nima became a trekking guide, working in English, German, and Japanese. He saved his earnings and rented a house about 200 yards from the airstrip at Lukla, which in 1993 he turned into Everest Lodge, now a successful hotel and restaurant business.

With a fairly reliable income from the lodge, Nima has taken the next step on the career path of the upwardly mobile Sherpa. Relying on his wife, Dawa Lhamu Sherpa, to manage the hotel, last fall he set up a trekking company of his own, Authentic Everest Trekking, Ltd., in Kathmandu, 125 miles from Khumbu. "I book the hotels and the planes and the Sherpa guides," he explains. "I make a fee on each transaction."

The course of modern events appears to have been good to the Sherpas, but a few storms loom on the horizon. When the average Sherpa family earned its living by herding yaks and planting potatoes on the steep hillsides, it was easy to ignore what was happening anywhere else. Now that the Sherpa economy is tied to tourism, developments far away have grave importance. The worldwide downturn in tourism following the attacks of September 11 had a heavy economic impact on the Sherpa community. The bloody Maoist insurrection that has ravaged Nepal for the past seven years is also taking its toll, although a cease-fire declared by the rebels in late January has raised hopes for an end to the violence.

Then there is the concern that as Sherpas leave Khumbu for even better opportunities, they will leave their culture behind as well. And there are mixed feelings about some of the modern conveniences made possible by the Sherpas' success, as I learn when I make the trek

**WHEN SHERPAS BUILD A HOUSE
IN KHUMBU, THE MATERIALS MUST BE
CARRIED UP TRAILS ON SOMEONE'S BACK.**

to the handsome stone monastery at Tengboche to visit its well-known head lama, or rimpoché (a title that means “precious one”). The Sherpas’ revered venue sits at 12,700 feet, atop a ridge that offers perhaps the most breathtaking sunrise on Earth. As night gives way to morning, the pink glow of dawn glistens on the snowy peaks of eight surrounding mountains, with Everest (29,035 feet) and its close neighbor Lhotse (27,890 feet) as the jewels atop the jagged crown. Having seen that view, I am in a suitable state of awe as I remove my hat and shoes to enter the lama’s private apartments.

The rimpoché, 68, is considered to be the reincarnation of the monastery’s first lama. Thus

he enjoys a level of comfort unknown to most of his followers. He sits on a cushioned sofa at a polished wooden table, with a bright reading lamp over his shoulder to illuminate his scripture and a hot plate to keep his tea warm. Feeling chilly at one point, he gestures silently to a younger monk, who wheels in an electric radiator and turns up the dial. When I ask the lama specific questions about Buddhist beliefs, he refers me to his website, www.tengboche.com.

And yet the rimpoché expresses considerable concern about the encroachment of modern ways on Sherpa traditions. “When the Sherpas were farmers, with yak and cow, our life was good,” he says. “Now most people are in the trekking

WHERE SHERPAS ROAM

The first Sherpas probably crossed the Himalaya from eastern Tibet in the 1500s, settling in the region below Everest. Today some 70,000 Sherpas live in north-eastern Nepal, but it’s the 10,000 or so who reside in the Solu-Khumbu region (right) who have benefited most from the mountaineering boom—and created a certain Sherpa mystique.

HONORING THE PEAKS

Tenzing Norgay, the Sherpa who climbed Mount Everest with Hillary, said he scaled the mountain the way a baby climbs into the lap of its mother, according to his son Jamling Norgay, also a climber. Sherpas urge their clients to ask the mountain deity’s blessing with offerings of rice and incense at Base Camp. The peak is one of many held sacred by Sherpas.

CASHING IN ON TOURISTS

Buddhist legend holds that Everest is home to a goddess bearing a bowl of food and a mongoose spitting jewels. Everest has indeed brought prosperity to the region. Sherpas not only profit from the tourist industry, they own much of it, from the yaks to the local airlines.

COPING WITH THE MAOISTS

Since the Maoist uprising in 1996, more than 7,000 people have died in clashes with civilians or the Royal Nepalese Army. Operating mostly in poorer western and central Nepal, the Maoists have little support among Sherpas. Yet the violence has led to a curfew in Namche Bazaar. A cease-fire was declared in January.



FOR GENERATIONS THE SHERPAS NEVER TRIED TO CLIMB EVEREST UNTIL A STEADY STREAM OF “PEAK BAGGERS” FROM THE WEST MADE IT PROFITABLE.

business, and that business goes down or up based on outside events. Is this better?

“In the past we had no telephones here,” the lama goes on. “And it was no problem to be without a telephone. But now we have had telephones. We came to need them. Then when the telephone repeater was bombed [by the Maoists], suddenly it was a big problem to be without. Is this better?”

Yes, say most Sherpas I spoke with. The Sherpa people, they will remind you, have always used outside influences to their own advantage. “The fact that we were separated from the rest of Nepal, way up in our high country, made it easy for the Sherpas to preserve our culture,” says Ang Rita Sherpa, a graduate of the Khumjung school who now heads Hillary’s foundation, the Himalayan Trust, in Kathmandu. Over a steaming bowl of *shakpa*, a pungent potato stew, Ang Rita points out that, despite their remote geographic setting, the Sherpas kept open minds about ideas from the outside—maybe because they are outsiders themselves.

“Sherpa” means “person of the east.” The first Sherpas are believed to have walked from eastern Tibet in the 16th century, crossing the Nangpa La pass to reach the southern slopes of Everest. They settled in Khumbu and Pharak, in the valleys and precipitous canyons of the Bhote Kosi river and the Dudh Kosi or “milk river,” an apt name for a torrent that churns and foams like a vanilla milk shake in the monsoon months of summer. Gradually, many Sherpas moved into the lower, gentler hills of the Solu region south of Khumbu and Pharak, where milder

temperatures make farming more productive.

In the remote villages of the Solu-Khumbu region, largely beyond the reach of the Hindu majority in lowland Nepal, the Sherpas formed a distinctive culture. Their language—still thriving today—has Tibetan origins. Their pervasive religious faith, the Nyingma sect of Mahayana Buddhism, promotes the idea of compassion for all human beings; thus the Sherpas developed a social structure much less rigid than the caste distinctions common among Hindu Nepalese. Tradition taught Sherpas that some of the mighty mountains just over their shoulders were the abodes of the gods, to be respected from afar but not intruded upon. And so for generations they never tried to climb Mount Everest or the other great Khumbu peaks—until the steady stream of “peak baggers” from the West made mountaineering a profitable enterprise.

“Three decisive innovations made the Sherpas what they are today,” says Ang Rita. “British travelers brought potato plants to the Himalaya in the 19th century, and the Sherpas recognized that this could be a staple crop for the Khumbu climate. In the 20th century the introduction of iodine made an important improvement in public health [by eradicating goiter, which was widespread until the 1960s]. And the Westerners who wanted to climb the high peaks gave us the foundation of a tourist economy that has produced more wealth than agriculture or trading ever did.”

Sherpas began migrating to Darjiling, India, more than a hundred miles east of Khumbu, in the 19th century to find construction jobs around the summer resort set up for British officials in northeastern India. When the first British mountaineering expeditions headed to Mount Everest in the early 20th century—traveling from



Lightbulbs replaced kerosene lamps when Namche Bazaar got electricity from a hydroelectric plant in 1983. Televisions came later. A contemplative Buddhist painting competes with *Jurassic Park* for the attention of Temba and his mother, Ang Dooli, of Khunde. "There's less talk among family members," says Temba's brother, Ang Rita. "But there's no entertainment here except ceremonies and festivals. TV helps people pass the time."

A Sherpa guide (bottom, at left) points out the peaks to Austrian trekkers outside a Namche Bazaar lodge. To avoid altitude sickness, most visitors spend a day getting acclimatized in Namche, elevation 11,300 feet. Rush hour consists of a few yaks—the freight cars of Khumbu—lumbering past a cybercafé, a lifeline for the electronically wired. The café's owners also run a grocery store, a lodge, and an outdoor equipment shop.



northeast India through Tibet because Nepal was closed to foreigners until 1949—they hired strong young Sherpas in Darjiling to be porters. A Sherpa contingent became essential for every climbing expedition; when the British expedition of 1953 became the first to reach the roof of the world, the final assault team comprised one New Zealand climber, Edmund Hillary, and one Sherpa, Tenzing Norgay.

The conquest of majestic Mount Everest caught the imagination of the world, bringing an unprecedented number of climbers to Khumbu each spring and fall. It also brought the Sherpas a generous and indefatigable benefactor in the person of Hillary (see “My Story,” page 38). To speed construction of the hospital in the village of Khunde, Hillary oversaw the construction of the airstrip on a dramatic mountainside in Lukla—a runway that has had the unintended result of fueling the massive tourist trade. Quickly, each of Khumbu’s 25,000-foot-plus peaks was topped, with Sherpas playing a central role in the expeditions. Even more crucial to the Khumbu economy was the development of the trekking industry, in which Sherpas lead tourists on week-long hikes from Lukla to popular destinations like Kala Pattar and Gokyo, stopping at inns and cafés along the way.

“Those boys out there, most of them, are planning for jobs in the trekking industry,” says Mahendra B. Kathet, the headmaster of the Khumjung school, as we watch the high school boys booting a soccer ball around the school’s hard-mud playing field. “But if the trekkers don’t come, where are the jobs?”

The trekkers almost stopped coming in 2002. They were deterred not only by the events of September 11 but also by the state of emergency the Nepalese government declared in November 2001 after negotiations with the Maoist rebels failed. Nepal’s ferocious domestic insurrection was launched in 1996 by a secretive, self-styled Maoist known as Comrade Prachanda. He wanted to replace the constitutional monarchy with a **socialist republic**.

Prachanda put together an army, apparently

several thousand strong, of impoverished rural farmers who are frustrated by an unresponsive government and see civil war as the only solution to the sheer misery of their lives. In the western regions of Nepal, people live on what they can grow, never seeing a penny of the tourist income that pours into trekking regions of the country or the foreign aid that flows to Kathmandu. The Maoists, both men and women, attacked police, soldiers, and other government employees, hacking off their victims’ limbs one by one with farm sickles. The rebels regularly looted banks and bombed bridges and communications facilities; they kidnapped teachers and thus shut down the schools in rural regions. The Royal Nepalese Army reacted with large-scale assaults on rebel hideouts by helicopter-borne infantry units. Since November 2001 more than 4,000 people have died, most of them alleged Maoists killed at the hands of security forces.

The rebels publicly stated that they would not target tourists; while some trekkers were forced at gunpoint to make “contributions” to the rebel cause, there’s no record of tourists being killed by the insurgents. Sherpas told me countless times that the Maoist rebellion was restricted to western Nepal and had no impact on life in Khumbu. Perhaps they don’t want to scare away tourists, but this reassurance is demonstrably untrue. The influence of the insurrection on Sherpa country is plain for anyone to see.

In the seemingly peaceful Khumbu town of Namche Bazaar, soldiers in green fatigues patrol the streets with automatic weapons over their shoulders, enforcing a curfew that has essentially ended nightlife. Even the centerpiece of social activity in Namche, the Friday night movie—it’s actually a video shown on a large-screen TV—has been suspended because of the curfew. The headquarters of Sagarmatha National Park, on a green meadow at 11,600 feet, was once a popular tourist spot. The park was created in 1976 to protect the area from environmental degradation, turning virtually all of Khumbu into a state-regulated area. It offers trekkers their first clear view of Mount Everest, the mighty peak floating above a fluff of cloud to the northeast. But today the park headquarters is a forbidding place, surrounded by sandbags, barbed wire, and tense soldiers on the lookout for Maoists.

THERE'S A SHERPA ROCK BAND IN NEW YORK, A SHERPA RESTAURANT IN TOKYO, AND SHERPA HIKING GUIDES IN RESORTS ALL OVER THE WORLD.

The frightening stories about the Maoist insurrection have had a serious effect on tourism. I saw the downturn in graphic terms in the office of Kamal Jung Kunwar, the acting chief warden of Sagarmatha National Park. He had a hand-drawn chart on his wall showing the number of tourists entering the park over a 15-year span. Year after year the tourist figure went up—from 8,135 in 1987 to a record total of 25,292 in 2000. By the end of 2002, the number had plummeted by 39 percent. Guesthouses sat empty beside the mountain trails; backpacks and water bottles went unsold in the shops; Sherpas waited beside the Lukla landing strip for clients who didn't come.

The fighting has taken a toll on Sherpa life that goes beyond economics. To preserve forest cover, the government has banned Sherpas from cutting any living tree for firewood within the borders of the national park. But now environmental concerns take second place to national security: Last year the army clear-cut ten acres of forest around park headquarters, to deprive the rebels of a place to hide.

"It was so sad to see those trees go," says Kunwar. "It hurts to think how long it will be before we have forest here again. At this altitude it takes 20 years for a new tree to grow just five feet."

In the spring of 2002 the rebels blew up the telephone repeater station at Patale, shutting down telephone service to and within Solu-Khumbu. "It would be easy for the government to replace the repeater," Ang Rita Sherpa says. "But if they did, they couldn't defend the new one. So we have lost our telephone connection. It's as if we had to go backward in history."

If the cease-fire holds, or even if it doesn't, Sherpas are optimistic about the future of the tourism industry. "The last two years have not been good, but this year will be different," says

Nima Nuru Sherpa. "This will be the 50th anniversary of the climbing of Everest! We are sure that a record number of visitors will come."

When it comes to predicting what will happen as more and more Sherpas leave Khumbu, there is less optimism. The strong

sense that educational opportunities are better in Kathmandu and other large cities has fueled an exodus among young families. It is hard to measure how big this movement has been, because there are no reliable census figures for the Sherpa population. But the trend is clear.

Only 10,000 or so Sherpas remain in Solu-Khumbu. The rest have scattered to towns and villages across northeastern Nepal and India. Thousands now live in Kathmandu, where most of Nepal's trekking and climbing agencies are headquartered. Farther afield, there's the Sherpa rock band in New York City, the Sherpa restaurant in Tokyo's Shibuya district, and Sherpa hiking guides in mountain resort areas all over the world.

Many Sherpas fear that this modern diaspora will dilute the traditional culture. "When someone in the family dies, the Sherpa way is to keep the body at home for two or three days to mourn," Ang Rita says. "But if you live in Kathmandu and rent a house belonging to a Hindu, he wants to get a dead body out of his house immediately. So it is really not a Sherpa home anymore."

I began to understand the implications of the Sherpa dispersion when I trekked through a forest of birch and rhododendron at 11,400 feet to the quiet village of Thamo, a collection of four



Ang Gelu Sherpa, a pilot for a Sherpa-owned airline, prepares to fly from Kathmandu to the airstrip at Lukla, where most visitors begin their Everest adventures. Kathmandu locals practice their moves on a wall at the Pasang Lhamu Mountaineering Foundation. It was named after Gelu's sister, the first female Sherpa to summit Everest, who died on her way down. "People didn't believe a Nepalese woman could do it," says Gelu.

Trekking pays, but it also costs. Newfound income enables some parents to send their children to boarding schools like Mt. Kailash in Kathmandu (below). But Sherpas must now contend with litter, erosion, and forest degradation caused by the demand for fuelwood and lumber. Many are working hard to address the environmental toll, with reforestation projects (bottom) and periodic trash cleanups in villages and along the trails.



dozen rectangular homes perched like colorful Lego blocks on a steep slope about a 90-minute walk from Namche. It's hard to imagine a more dramatic place to live. Just to the east looms the majestic white pyramid of 18,901-foot Khumbila, to my eyes, the most beautiful peak in the whole Everest region—and one most sacred to Sherpas. Across a gorge to the west, a half dozen hundred-foot-high waterfalls crash down the cliff face to the rumbling Bhote Kosi river.

On a chilly, misty day in mid-September, nearly all the residents of Thamo are out in their fields harvesting the potato crop, pulling a year's sustenance from the soil. In a potato field down by the river I meet Pasang Namgyal Sherpa, a tiny figure with a latte brown face and wispy white hair that sticks out here and there from his red knit cap. Pasang, 74, introduces me to his wife, Da Lhamu, 73. The couple invite me in for Sherpa tea, an astringent brew made in a wooden churn with salt and melted yak butter. It's an acquired taste that I will never acquire, even though Da Lhamu hovers around me all afternoon with the teapot, repeating an insistent Sherpa phrase that obviously means "Drink up! Drink up!"

Their home is a classic Sherpa farmhouse. We step over a high wooden threshold into a gloomy first floor full of sacks and baskets holding potatoes, turnips, cornmeal, and a stack of drying yak dung, to be used as cooking fuel. Up a wooden staircase—so steep it is really a ladder—we come to a single long room, with benches around the walls for sitting or sleeping, and an open hearth in one corner that provides what little heat and light the house has to offer. There are two small lightbulbs in the ceiling, powered by a hydroelectric plant the Austrian government finished in 1995 as a foreign aid project a few miles upstream. But Pasang tells me he only uses them at night, which keeps the electricity bill down to about two dollars a month. The house has no clock, but it does have a calendar, nailed to a beam, indicating when the new moon and the full moon will come. On those two days each month, Pasang forgoes farmwork and stays in to read and chant scripture.

Pasang and Da Lhamu have about 12 teeth left between them, but their smiles gleam as they tell me their life stories—born in Khumbu, married in Khumbu, farmed in Khumbu—and proudly list their possessions. They have several terraced fields, totaling about four acres, plus three cows

and three *zopkios*, a male yak-cow crossbreed. "I had 11 sheep too," Pasang says, "but I had to sell them because I'm getting too old to keep the dogs away from them."

"Well, if you're getting old," I ask, "who's going to take over this farm?" With that the cheery smiles disappear. The couple's son, it turns out, had taken a job on a climbing team and died in an avalanche in the autumn of 2001. An exact number of how many Sherpa climbers have died on mountaineering expeditions is hard to come by, but by one estimate, 84 died from 1950 through mid-1989. Of the 175 climbers who have died on Everest, a third have been Sherpas. Most Sherpas probably have lost a friend or relative to a mountaineering accident. A few high-altitude porters stop climbing after a friend's death. But most see it as an inevitable hazard and go on, motivated by the money the job brings in.

Pasang and Da Lhamu's only surviving child is their daughter, Phuti. She married a fine man and had two beautiful children, Da Lhamu says, digging out the family photos. "But she's gone to Kathmandu. We won't see her back here."

Amid the dusty bedlam of Kathmandu's heavily Buddhist Boudhanath neighborhood, where a cacophony of motorcycle engines, truck horns, rooster calls, police whistles, fruit hawkers, and chanting sidewalk monks fills the kerosene-laced air, I look up Pasang and Da Lhamu's 32-year-old daughter, Phuti, and her family in a four-room flat atop a row of small food stalls. The apartment house next door is about 24 inches from their window. There are probably more people living within 50 yards of their home than in the entire village of Thamo.

Phuti and her husband, Nuru Nawang, a Sherpa from Solu, serve me a cup of sweet milk tea and show me their place. They have a television set, a refrigerator and stove, a telephone (equipped with caller ID), an indoor toilet, and tile floors. The house has two clocks and the same calendar I had seen on the wooden beam in Thamo. Nuru, who studied to be a monk, says he would like to devote the days of the new and full moon to scripture readings, but his job as a trekking guide often makes that impossible.

Phuti introduces me to the most important reasons she lives in Kathmandu: her daughter, Dawa, 6, and her son, Paldep, 5—both resplendent in the crisp gray uniforms, with red and orange trim, of the Unique International High School. They are in the elementary school there, studying both in English and Nepali. “The schools at home are no good,” Phuti says decisively. “And it is a 90-minute walk, for my little children. Here they have a 20-minute bus ride.”

Not everything about this decision is desirable, Nuru concedes. “Our children do not know the Sherpa language, or very little, anyway. When we take them to Khumbu, they don’t know the names of the mountains.” The children, their father notes sadly, did not even recognize the name of Pasang Lhamu Sherpa—the first Sherpa woman to reach the summit of Everest—when they saw the bronze statue honoring her on the main street of Boudhanath. “We want to pass on our beautiful culture and traditions,” Nuru says. “But it is not so easy here.”

The couple tell me that they definitely intend to go back to the Sherpa homeland—but not for many years to come. “I don’t like being cold and wet,” Phuti says in guilty tones, as if this confession makes her a bad Sherpa. “In Thamo the only job I could get was as a porter,” she goes on. “Carrying kerosene cans, 15, 20 kilo, for 50 rupees [65 cents] a day. It rained. It snowed. I was cold, wet, tired, all the time.” That was 16 years ago. “In Kathmandu, everything is easier. Here, I worked in a tea shop—and I rode there on the bus!”

It’s this dispersion of young people, rather than the modern influence of tourists per se, that worries many Sherpas. After all, back in Khumbu, the old ways still persist in many aspects of Sherpas’ daily life. Their washing machine is the rushing river. Their dryer is the sun. The kids use round pebbles as marbles and play catch with potatoes. With rocks and branches, Sherpa farmers construct diversion channels beside the

mountain streams to drive the waterwheels that grind their grain into flour. The same streams are used to spin the prayer wheels that dot Sherpa country. “In Khumbu, our traditions are maintained,” Ang Rita Sherpa says.

Indeed, a National Geographic Society-funded study on the impact of tourism on the Solu-Khumbu region by Stan Stevens, an associate professor of geography at the University of Massachusetts at Amherst, found that Sherpas are not much concerned over tourists’ direct role in cultural change. The Tengboche monastery is thriving. And some religious festivals have been rescheduled to off-season periods when few tourists are around. Most Sherpas seem able to blend the new with the old as easily as the farmer I saw at a tiny bar in the village of Beni; he was sipping alternately from a tall bottle of Carlsberg and from a shallow cup of chang, a thick, home-brewed beer.

Sherpas are particularly good at juggling tradition with modernity when it comes to their health care. Thanks largely to such organizations as the Himalayan Trust and the Sir Edmund Hillary Foundation, Western medicine and dentistry are available, almost for free, at several places in Solu-Khumbu. The Sherpas use these outlets regularly, but that has not stopped them from a continued reliance on herbal medicine, on faith healing, and on the Sherpa shamans known as *lhawas*.

“People are absolutely multimedia when it comes to medicine,” says Heather Culbert, a Canadian doctor volunteering at Khunde. “They come in here and get vaccinated against measles or polio, and then they go to the monastery and get an amulet from the lama to ward off the same disease.”

The one medical tool that no doctor can offer in the roadless precincts of Solu-Khumbu is an ambulance. “Sometimes we get someone who broke his leg, or was (Continued on page 71)

“I DON’T LIKE BEING COLD AND WET,”
PHUTI SAYS IN GUILTY TONES, AS IF THIS
CONFESSION MAKES HER A BAD SHERPA.



Living on the edge is a way of life in Namche Bazaar, perched on the brink of a chasm. Residents tend intricate terraces planted mostly with potatoes. Introduction of the crop, probably in the 19th century, helped move Sherpas away from trading to a more settled lifestyle.





Shoppers often walk for days to stock up at Namche Bazaar's Saturday market. They return home with everything from goats to solar panels, as well as the latest knock-off running shoes and parkas carried in from neighboring Tibet.







The solemn demeanor of a monk from Thame monastery belies some of the lighter moods of Mani Rimdu, an annual festival of drama and dance to banish evil spirits. Despite Western influence, Buddhism remains an anchor in the Sherpas' changing world.

gored by a yak, and is carried in on a board by his friends," says Culbert. "But most patients come to the hospital on foot. Even very ill patients walk here. It's the only way."

Last fall, a woman trekked the three hours from the village of Phortse to Khunde hospital, gave birth to twins an hour after arriving, and walked home with the babies on her back two days later. "Sometimes women have their babies on the trail before they get here," Culbert says. "And they turn around and walk back home. The delivery is over, so who needs a doctor?"

On the steep, rock-strewn mountain trails of Sherpa country, new mothers walk with farmers, yak herders, mail carriers, kindergartners, great-grandmothers, and exhausted, sweating porters bent low under the weight of cargo on their backs.

The Sherpas have brought all manner of modern innovations up the mountain trails. So why is there no room in Khumbu for the automobile, or the roads it could drive on? I posed that question to almost every Sherpa I met. The consensus view is that roadlessness is an essential element of the Sherpa condition. "If we rode a bus in Khumbu, would we still feel the steepness of our mountains?" asks Nima Nuru Sherpa. "Would we still hear the waterfalls coming down our cliffs? Would we stop and say a prayer when we passed a *mani* [prayer] stone?"

Still, Khumbu's lack of roads began to bother me, perhaps because I too was struggling up and down muddy mountain tracks every day I was there. And so I decided to take the matter to the reincarnate rimpoche at Tengboche monastery. "In my home state of Colorado, we have paved roads that cross narrow mountain passes as high as 14,000 feet. It wouldn't be impossible to build roads through this region. Why don't you do it?" I asked.

The rimpoche listened to my outburst with a pained look on his face, then answered, politely but firmly. "If Solu and Khumbu were in America," he says, "I have no doubt that there would be a road system through these mountains. That is what you do. But here, there will never be a road—not in my lifetime, not in our children's lifetime. We are Sherpas. We walk." □

WEBSITE EXCLUSIVE

How has Sherpa culture changed in the past decade? Listen to photographer Robb Kendrick's eyewitness report at nationalgeographic.com/ngm/0305.

MOLT, MATE, DIE



THE BRIEF, LUSTY LIFE

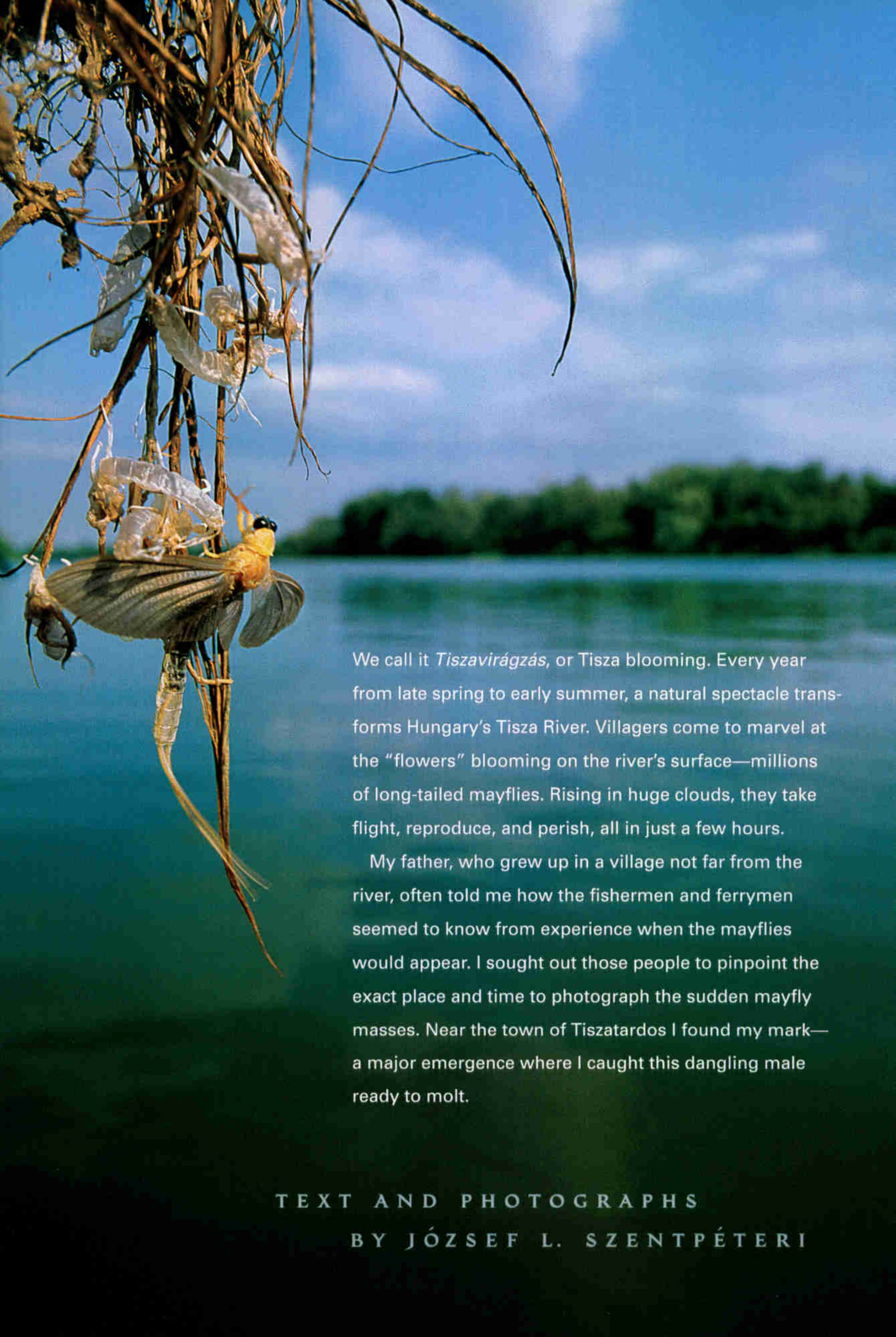
With their adult existence spanning only hours, male mayflies frantically seek females



OF THE

mayfly

on Hungary's Tisza River.



We call it *Tiszavirágzás*, or Tisza blooming. Every year from late spring to early summer, a natural spectacle transforms Hungary's Tisza River. Villagers come to marvel at the "flowers" blooming on the river's surface—millions of long-tailed mayflies. Rising in huge clouds, they take flight, reproduce, and perish, all in just a few hours.

My father, who grew up in a village not far from the river, often told me how the fishermen and ferrymen seemed to know from experience when the mayflies would appear. I sought out those people to pinpoint the exact place and time to photograph the sudden mayfly masses. Near the town of Tiszatardos I found my mark—a major emergence where I caught this dangling male ready to molt.

TEXT AND PHOTOGRAPHS

BY JÓZSEF L. SZENTPÉTERI

From the river's muddy cradle to fleeting freedom in the air



UNDERWATER GENESIS

The "ephemeron," Aristotle called the short-lived mayfly, which numbers 2,000 species worldwide. With males measuring up to five inches from head to tail, the Tisza's *Palingenia longicauda* is Europe's largest mayfly.

Shortly after mating, females lay eggs on the river's surface. The eggs

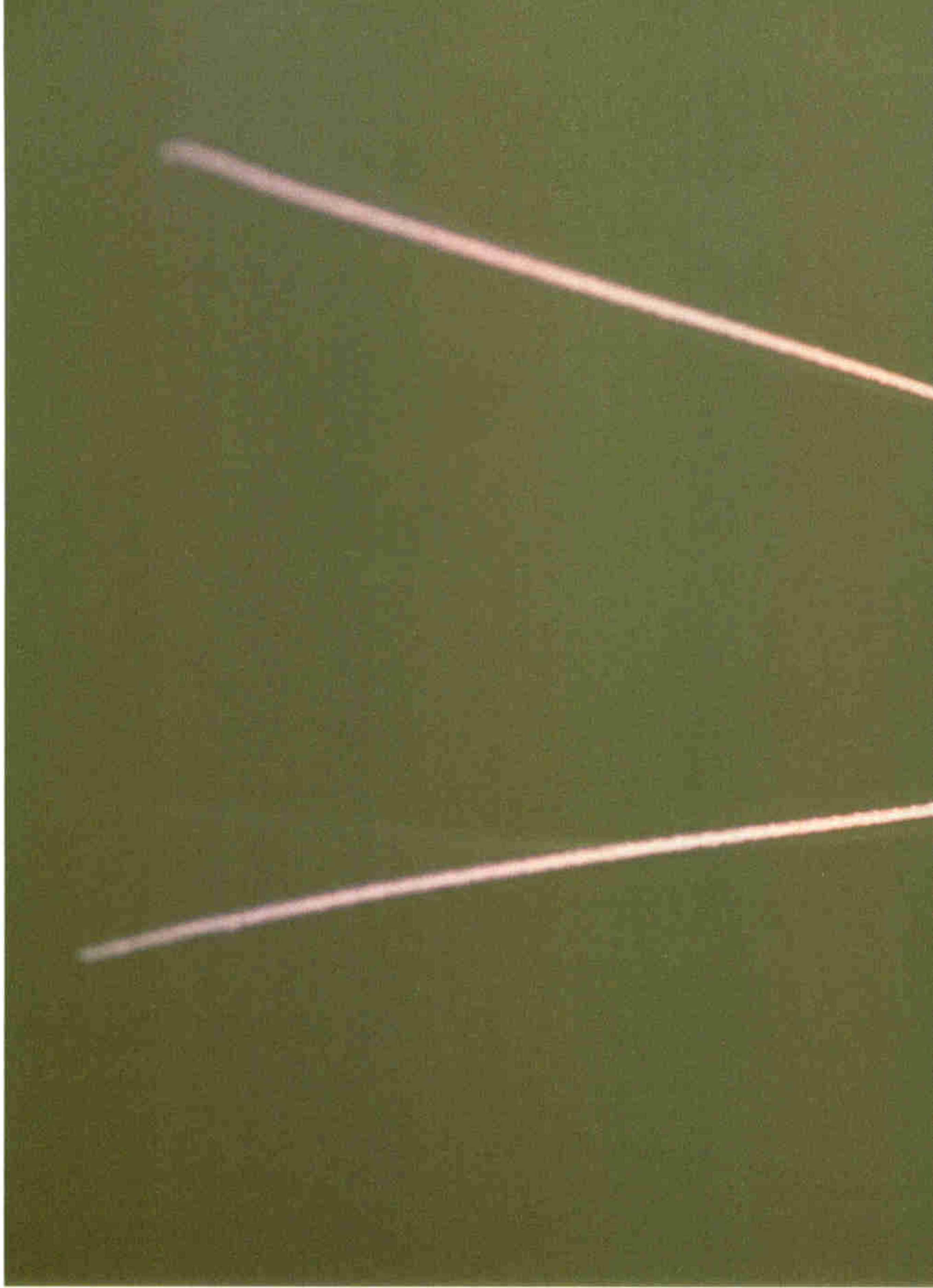
drift to the bottom and after 45 days hatch into larvae, which dig tunnels (above left), forming dense colonies up to 400 per square foot. After three years larvae break for the surface (top), where females molt once and males shed twice: first into a brief subadult stage (above right), then again minutes later into adulthood. After both sexes have fully matured, mayflies have roughly three hours before they die.

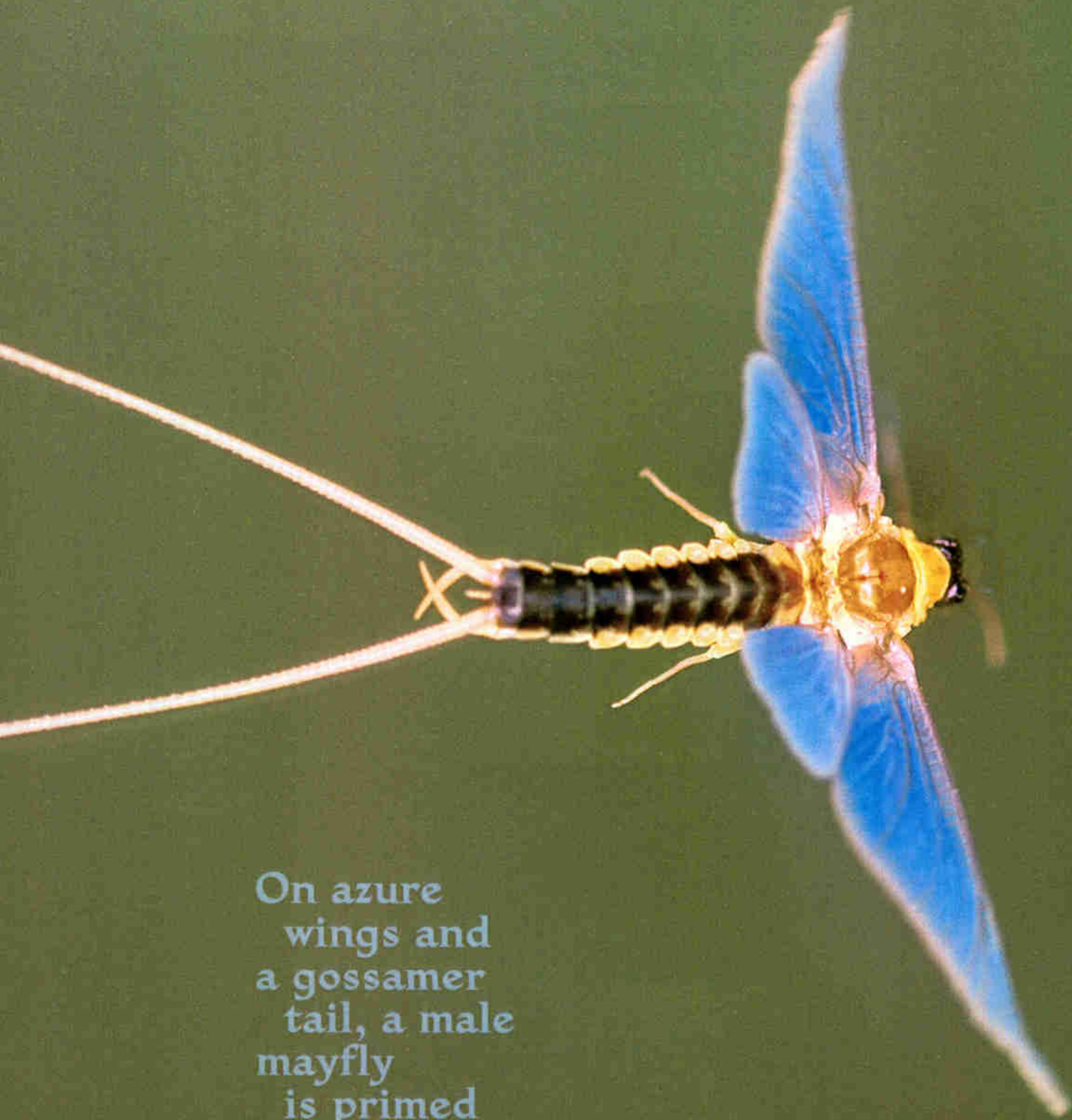
The Tisza's mayfly emergence seems miraculous after the environmental catastrophes that befell the river three years ago. In January 2000 a break in a retaining wall that

held back metal tailings at a Romanian mining pond released cyanide and other toxins into a Tisza tributary. The tainted water killed over 1,300 tons of fish in the lower Tisza. Villagers held symbolic funerals, laying wreaths on the water. Then in March heavy rains caused another Romanian retaining wall to fail, sending 22,000 tons of heavy metals into the upper Tisza. Two smaller spills followed.

How did the mayflies survive? Luckily the accidents occurred in winter, when the larvae were still buried in the mud. And later that spring more rain flooded the Tisza and flushed the river clean.







On azure wings and a gossamer tail, a male mayfly is primed to mate

METAMORPHOSIS

After molting on water and then flying to land, a subadult male sees the world through enormous eyes (far left). This growth stage lasts but a few minutes—just long enough for the males to find the riverbank and cling to a

solid surface. Once situated, the male quickly sheds (near left). The adult male emerges with spectacular blue wings (above).

Mayflies have evolved a clever mating strategy: An initial wave of subadult males blankets

the water—a sacrificial offering to ravenous fish, birds, and frogs. When predators are sated, the remaining subadult males molt and begin to seek out females, which appear on the surface bearing their precious eggs.



THE RACE IS ON



Relentless squadrons of males dive-bomb females on the Tisza. Polarized light attracts airborne mayflies to water. Researchers have discovered that certain kinds of asphalt can also reflect polarized light, which explains why distracted swarms can suddenly leave the river and choke roadways.



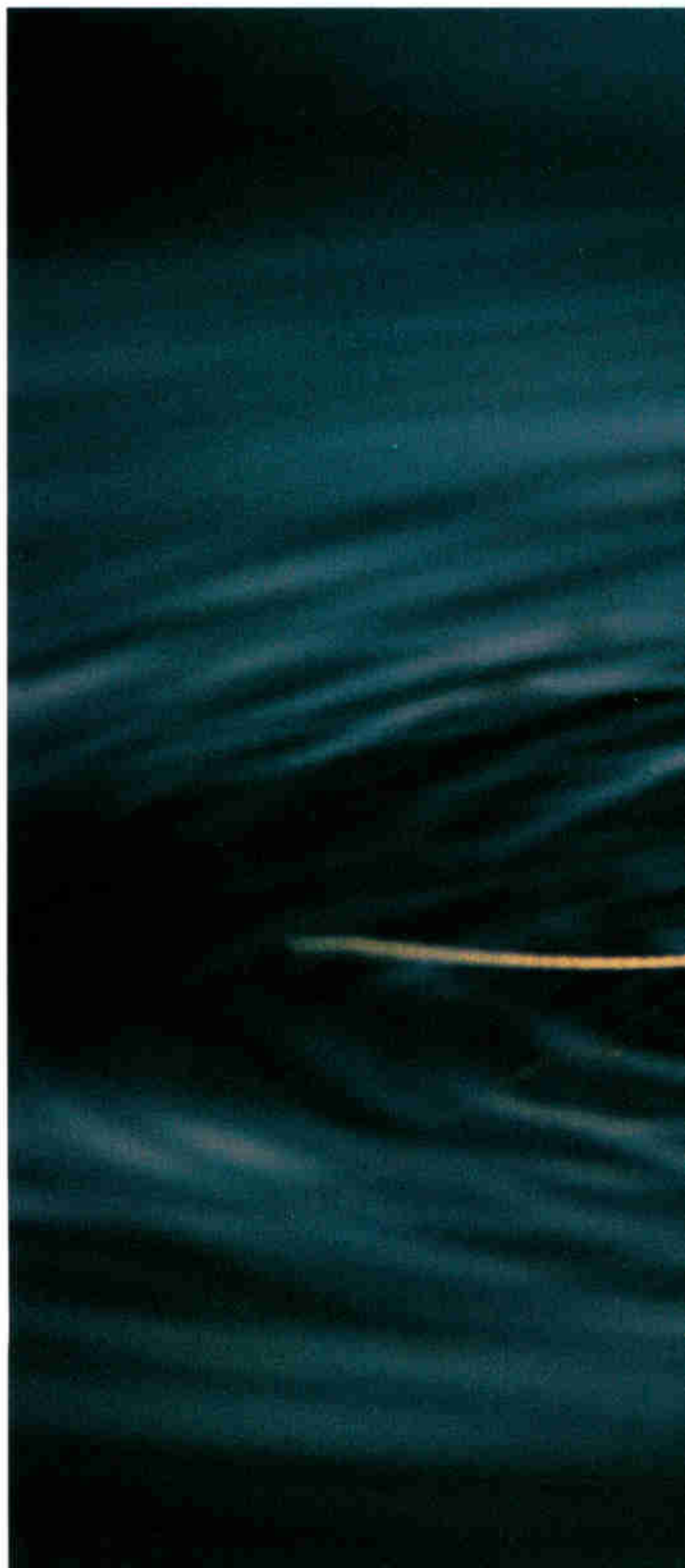
THE MATING FRENZY



During the mating period the river's surface explodes to life. Adult males flutter above the water, their wings a whirl (top).

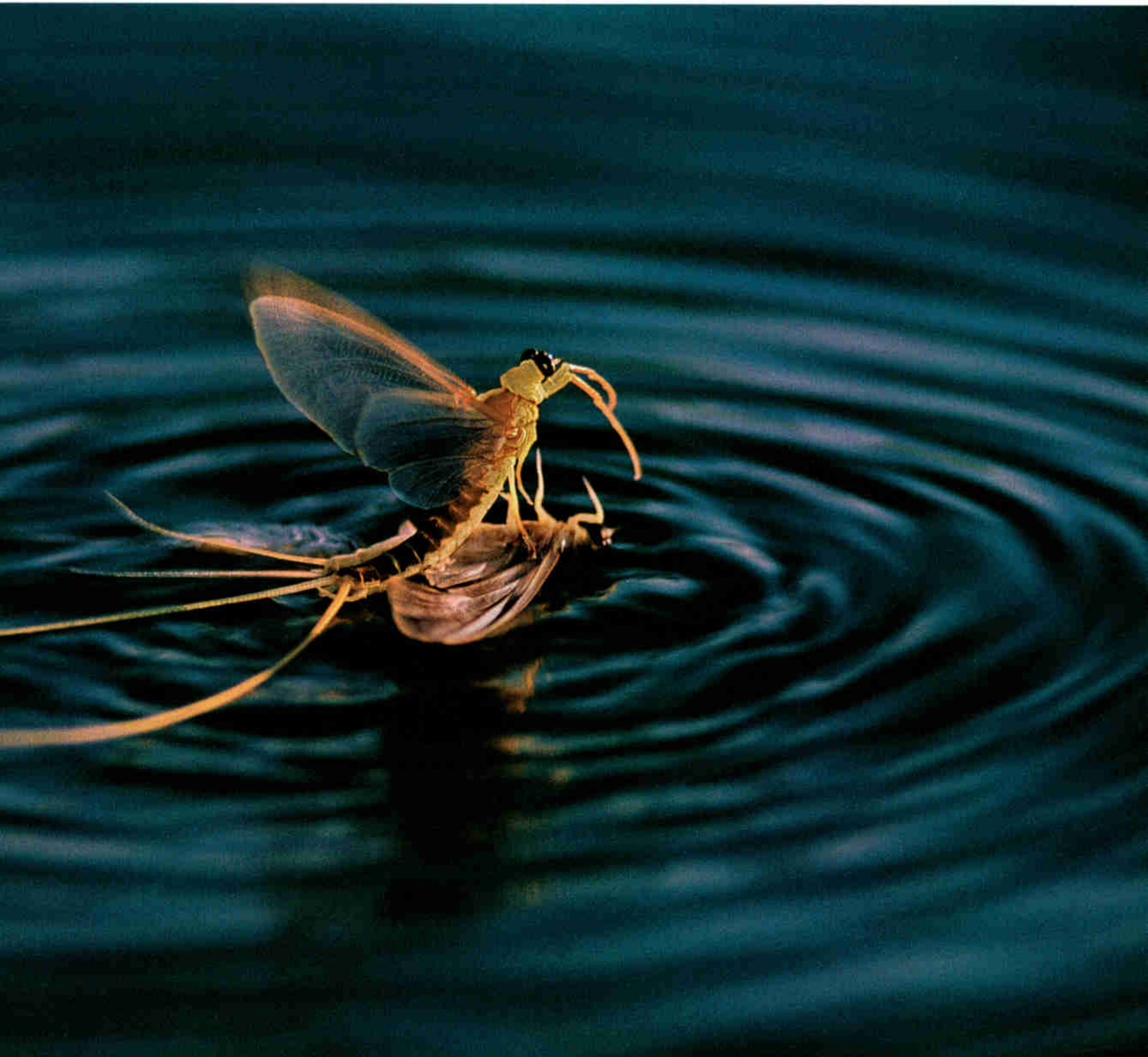
There is no courtship in the mayfly repertoire. Reproduction is often a forcible act with up to 20 males simultaneously going after a lone female. Here a trio of males besets a newly molted female (above). An eager male might also lie in wait atop the skin of a female that has yet to shed (right).

In the copulatory furor, males sometimes inadvertently attempt to mate with each other (above right). Suitors seem to follow visual cues to their targets: Females are characterized by smaller eyes and tails. They also have an amber body coloring, which is clearly a powerful allure. Males will try to copulate with anything of that hue. A scrap of yellow paper I set afloat on the water immediately drew a swarm of males.





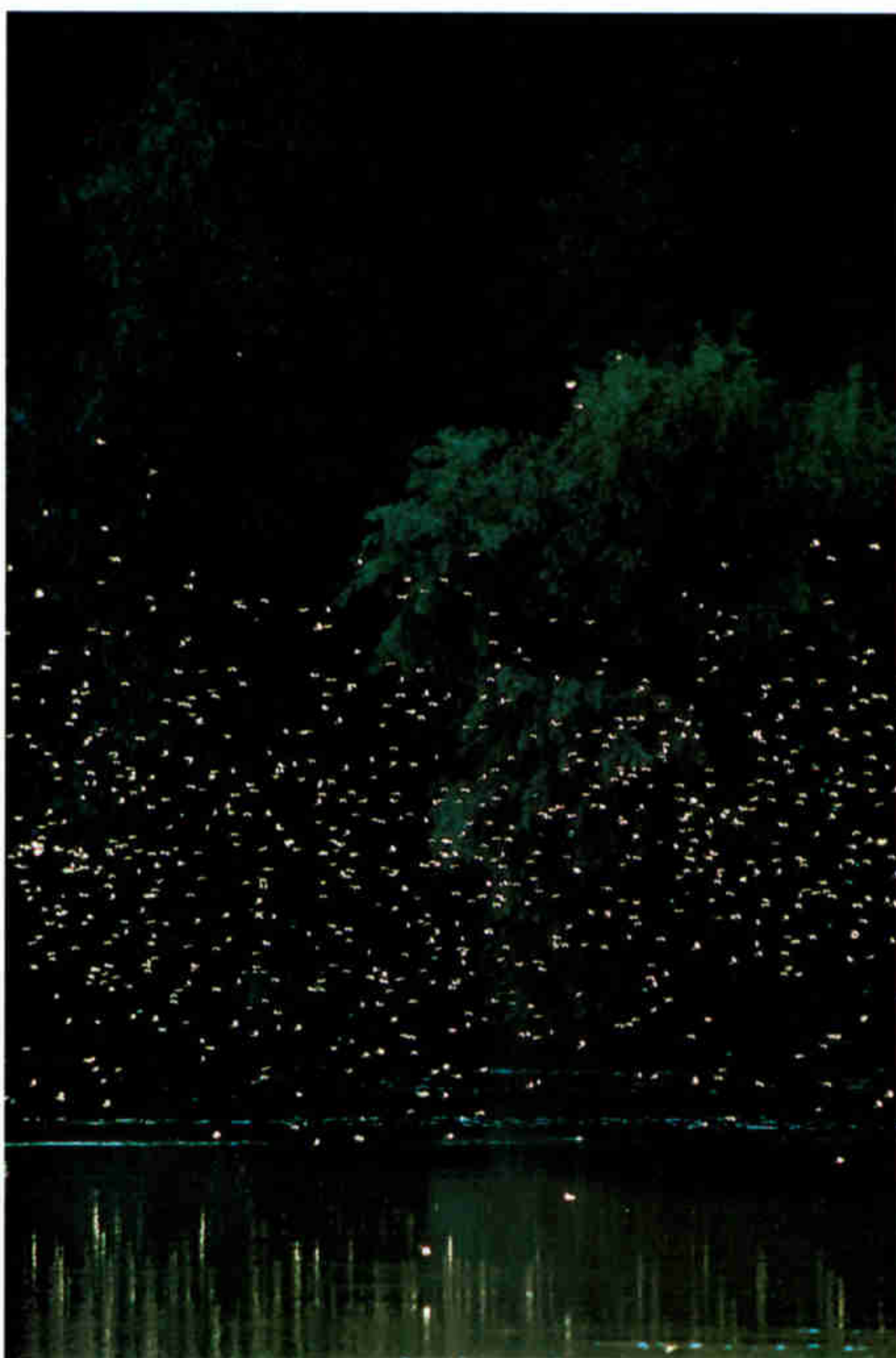
Male
competition
is fierce
in a
desperate
race
against time





Dead mayflies—and a few live ones—surround a kingfisher (left) and a lake frog (below). Millions of male mayflies create a windfall for predators, but most consider only living insects a worthy snack.

To ensure that their 7,000 to 10,000 eggs hatch safely, females perform a “compensation flight.” Instead of laying eggs near the colonies’ home site, where the current quickly would carry the eggs downstream, a luminescent cloud of females (right) flies several miles upriver to spawn. Eventually, fertilized eggs drift down to the females’ natal site and sink to the bottom.

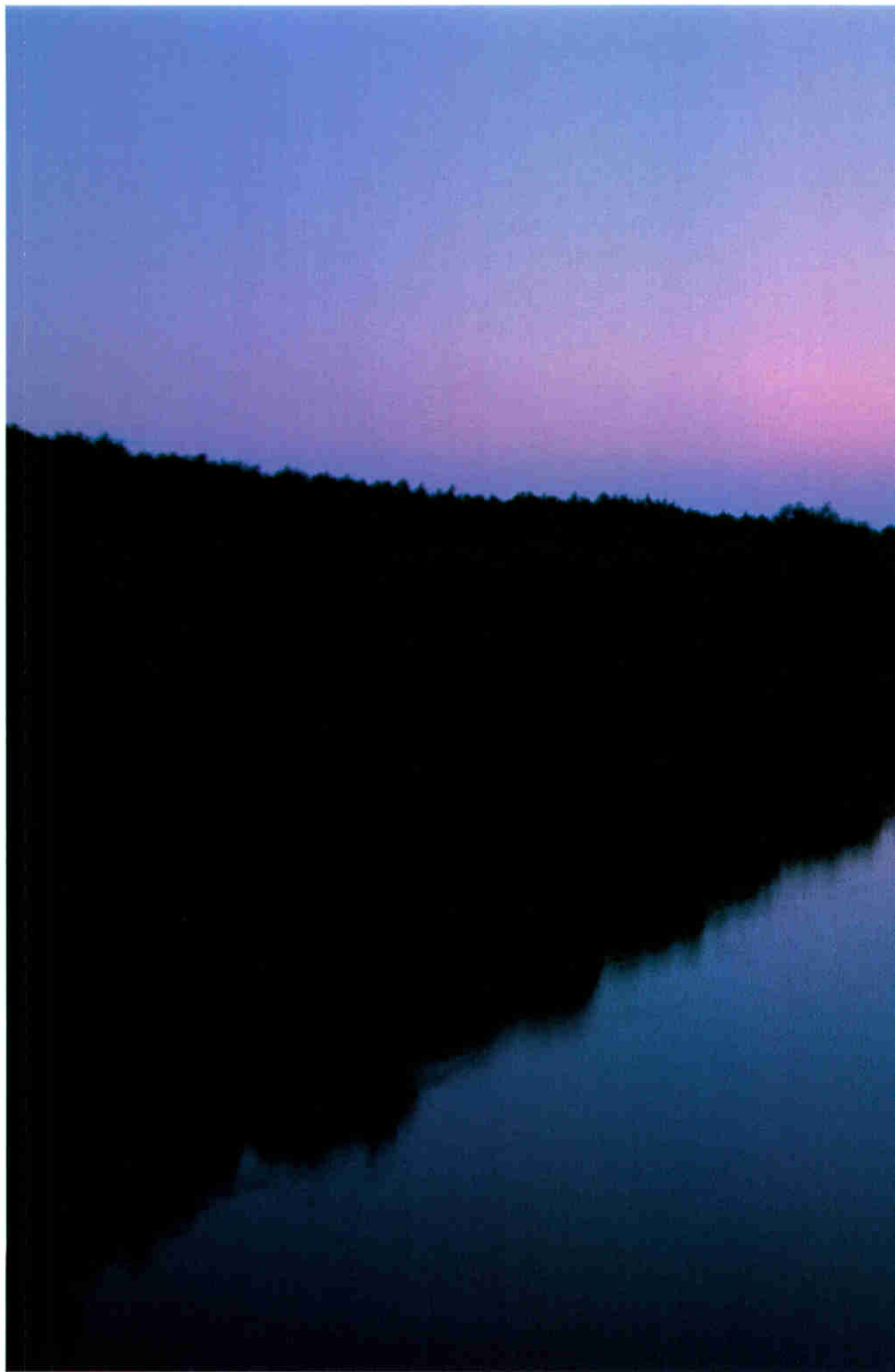


DEATH AND LIFE



WEBSITE EXCLUSIVE

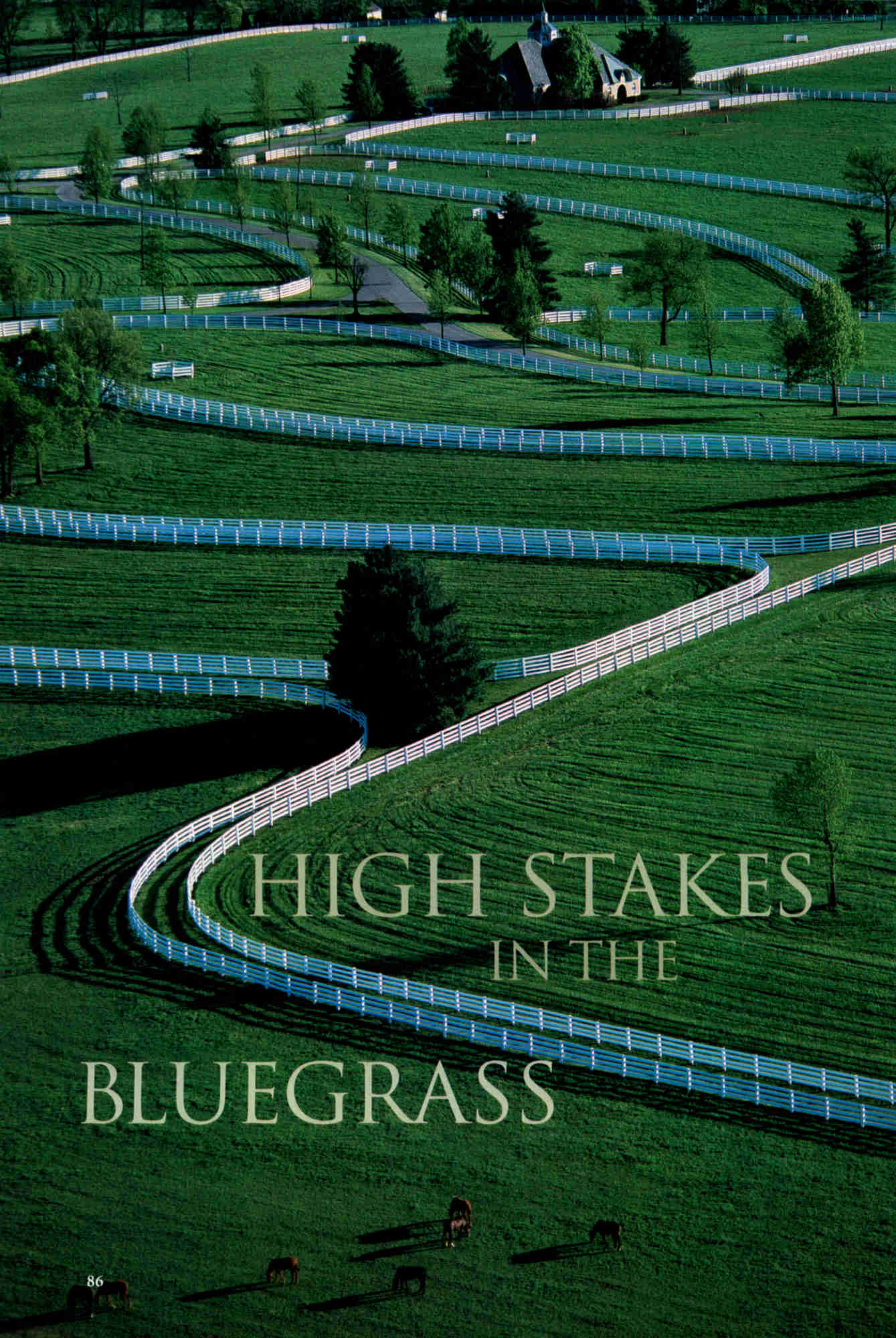
What happens when millions of mayflies swarm into town? Photographer and biologist József L. Szentpéteri tells you in an online interview. Also, check out more photos of molting and mating mayflies, or decorate your desktop with one of these critters at nationalgeographic.com/ngm/0305.



FINAL FLIGHT



A wraithlike female glides past sunset near the river's source. To keep alert for erupting mayflies, I enlisted several spotters armed with cell phones. My father, positioned nearby, called to warn of a swarm just as I glimpsed this apparition. I snapped the shutter to capture one last flower of the Tisza blooming. □



HIGH STAKES
IN THE
BLUEGRASS



Running for the roses, Kentucky Derby competitors tear up the track at Louisville's Churchill Downs. Most hopefuls were bred nearby in renowned Bluegrass country, where stately fences and farms like Donamire (opposite) guard the stars of Kentucky's billion-dollar business of Thoroughbred horses.



"It's the widest brim I've ever worn, for sure," says Rhonda Levitch, in cream, at Churchill Downs' Turf Club on Derby day. Competition for best dressed is almost as fierce as the race outside. Says a track official, "The crowd is as much a spectacle as the horses."



BY SHANE DUBOW

PHOTOGRAPHS BY MELISSA FARLOW

In the lush heart of Kentucky horse country, 34-year-old Marc McLean looks over his family's Thoroughbred stud farm and sees a lot more than the signs of spring. More than new buds and sprouting green things. More than once-white fence boards now redone in cost-cutting black. More, because these days he also sees horse-killing suspects. He sees, for example, the frosty shellac of an overnight cold snap, and he knows this frost might stress the grass and make it briefly noxious. Or he sees the odd tuft of tall fescue or white clover in the pastures, and he knows these plants can be toxic. And then there's the recent hatch of eastern tent caterpillars—their ubiquitous nests in the cherry trees like the snagged puffs of some cottony explosion—and he can't help but worry about their biblical numbers despite all the experts who say these caterpillars pose no equine threat.

It's a windy April morning, and Marc, in crisp jeans and a button-down, is leaning on a gate. Just now he's waiting on the "worm killers," two locals with a pickup-mounted bug sprayer, to make him feel like he's doing all he can. Nearby, his family's most valuable broodmare, Begin, stands pregnant and alone in a well watched paddock. In a few hours Marc will muzzle her up, due to a frost warning, to keep her from grazing on anything bad. "Long as last year's problems don't come back," he says, "that Begin foal ought to be worth, I don't know . . . a few hundred thousand would be nice." Moments later, however, as if to darken such hopes, a fast-traveling caterpillar worms on past. Then another. And another. Until finally, Marc sighs and draws a bead on the leader with his boot. "These worms' only natural predator," he cracks, "is the foot." Then he grinds down. And in this one beleaguered but resilient act, he frames the basic story of life on a hardworking family horse farm a year after

a baffling plague has left the state's famed pastures empty of some 3,000 foals, about 50 of which would have been born and raised here, on the McLean property, at Crestwood Farm.

So what might it take for a relatively humble, relatively traditional stud farm like Crestwood to endure this first 20-week breeding season since the industry's worst year? And what might happen to a farm like Crestwood and, by extension, to the central Kentucky horse world if that mysterious sickness comes back? No one really knows, but everyone's plenty worried, and the local papers are full of speculations and stats. There are some 500 Thoroughbred horse farms in and around Lexington, where most of the state's breeders cluster, and the pastures, fed by the rich leavings of a long vanished sea, are said to be among the world's best. Some of these farms boast thousands of acres of pasture, hundreds of horses, plus helicopter landing pads, stained-glass barn windows, and ornamental gardens fit for kings. But those farms are exceptions, symbols of the opulence for which the sport is known. And the lack of such indulgences at a place like Crestwood remains more the rule.

All told, the state's farms birth some 10,000 foals yearly and make up the economic and cultural hub of the U.S. racing industry. In Kentucky that industry accounts for some 40,000 jobs—all the vets, trainers, riders, grooms, blacksmiths, hot-walkers, handicappers, and others that make livings off these fleet-footed animals—as well as Keeneland, the nation's most regal track. Which isn't to imply that anyone thinks Keeneland alone, with its exclusive club and conservative dress code, might hold everyone else together if the plague returns and one of the state's top industries loses another 30 percent of its would-be foals.

It began in 2001 at one of the region's larger and more corporate-style operations called Taylor Made. It was midway through a historic spring heat wave tagged by three odd nights of rimy dew, when a well-known vet named Tom Riddle nosed his truck into one of the Taylor's spiffy barns. He'd come to perform some routine ultrasounds on a few pregnant mares. The procedure, which involves a wheeled video monitor and a rectal probe, would reveal the sex of the *in utero* foals. On Dr. Riddle's monitor, if all went well, the gestating forms would show

up with faint heartbeats and tiny genital buds, the fetus a fuzzy white planet in a dark sky of clear fluid, which, when healthy, shows up black. But now, in two of the scans, the dark sky looked more like a nighttime snowstorm—sans pulse. "What I was thinking," Dr. Riddle would later recall, "was that this was very unusual, very coincidental, to find two slipped foals back-to-back like that in the very same barn. Ordinarily, in a normal year, I might not see five like that during the whole season, and I might check 400 mares."

Over the next few days, as all the pomp of the Kentucky Derby (upcoming in Louisville 80 miles west) swung into gear, Dr. Riddle would find more distressed mares at several other farms and thus be forced to consider if this might not be some blooming epidemic. And yet the pattern seemed unclear. The troubled mares lived in various counties, grazed in various fields, slept in various barns, ate feed from various suppliers, had been bred to various studs. The only obvious connection, it seemed, was himself. Could he have spread some infectious agent in his daily rounds? Something on his boots, or a piece of equipment, or his truck? To find out, he ran his findings past some fellow vets and learned he wasn't alone. As select equine experts received hushed alerts—horse breeders are famously sensitive to bad PR—and as rumors of unprecedented early fetal losses began to mount, a second problem emerged: the sudden appearance of hundreds of late-term foals ending their 11-month gestations in a gushing placental tangle known as a red bag, a messy and dangerous form of birth.

By Derby day, unbeknownst to the giddy masses at Churchill Downs, a line of trucks bearing dead horse babies had formed outside Lexington's equine autopsy lab. And the lab, inundated with carcasses, had scrambled to make space, lining freezers and hallways with overflow horseflesh. Hours later, while Monarchos broke for the roses and all the gents in seersucker and ladies in hats fingered their bets, a common sight around Lexington became the flash of a vet-bound

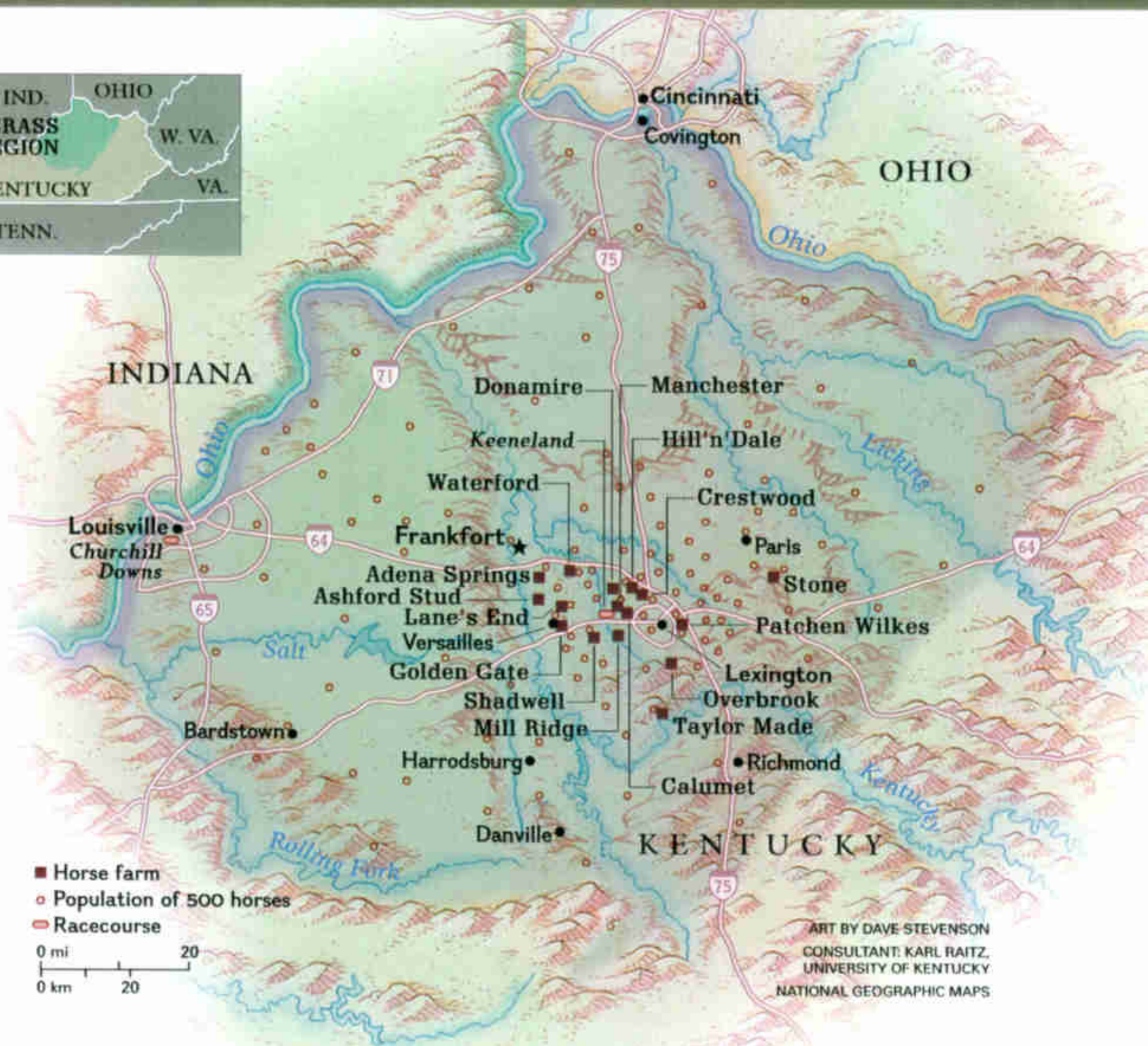




ROOM TO ROAM



Blessed with mineral-rich soil that fuels strong equine bones, gently rolling hills around Lexington are home to the world's largest concentration of racehorses. "When you see big trees, that means good soil with calcium and phosphate—great for horses," says Arthur Hancock III of Stone Farm (above), birthplace of three Kentucky Derby winners.



pickup, blood-spattered barn hands performing frantic mouth-to-mouth on stillborn foals in back. Which is about when this plague, which would come to be known as mare reproductive loss syndrome (or MRLS), hit Crestwood.

In a tough-loved pickup one year later, with his annual breeding season half done and no hint yet of the plague's return, Marc recalls the night his foals started dying. "At first it was just the late terms, the ones that break your heart, because you've carried them so far, and when they come out they're full-on babies. I think, for a while there, we had about five red bags in a row, and you're trying to save them, trying to pull 'em out fast, but a lot of times they just don't make it and it's really depressing. If you add in the early ones, yeah, we got hit."

So have such hits, at Crestwood and elsewhere, pushed breeders toward the fiscal edge?

At Mill Ridge Farm, Alice Chandler, whose father helped found Keeneland, will confirm only that discovering the plague's arrival in her barns, after returning from the Derby, made her feel "like the sky was falling. That was the first time I was aware of it," she says. "This sweeping problem. It was just awful." At Adena Springs, Eric Hamelback, then president of the Kentucky Thoroughbred Farm Manager's Club, reckons that "the entire industry will be feeling the ripples of this thing for the next few years. This year you'll see it in the annual sales with less weanlings. Next year you'll see the impact in terms of fewer yearlings. And in 2004 and 2005 you'll start to see it on the track with fewer horses there to compete."

Here at Crestwood, Marc's courtly, white-haired father, Pope Sr., a 40-year industry veteran, weighs in by first reminding me that Crestwood isn't "one of these fancy places that just does this as a hobby. We're not stringing up a lot of chandeliers in the sheds, if you know what I mean. We don't have any oil money or real estate money to play with. Every penny we make, we make from this"—breeding, boarding (about half of Crestwood's stock is client owned), and selling horses.

"So there you go," Marc adds later. "If we had another year like last year, if we lost another 30 percent, then we might be in some trouble. But surely we're about in the same boat as everyone else." His point being: If the syndrome returns

and its cause remains unknown, a lot of spooked clients might pull their animals out of the state and the whole Kentucky horse business might, as one bourbon-voiced old-timer puts it, "make like water in a bathtub after somebody pulls the plug." Or as Marc himself puts it as we park at the breeding shed where the stallions do their "work" and the McLeans, in a manner of speaking, make their best hay: "This MRLS doesn't discriminate. We're all in this together. We're just crossing our fingers and trying to make babies. You do know how we make babies, right?"

In fact, this baby-making, for many central Kentucky farms, is what being in the horse business is mostly about. More than any training or racing, it's the mating, foaling, and auctioning off of the resulting offspring that consumes many a farm manager's days. Which is to say, if you want a real glimpse at life on a central Kentucky horse farm, a glimpse that shows where these breeders go to facilitate new beginnings and recharge hopes, you could do worse than to visit a few breeding sheds.

At the top end there are those like the one at Irish-owned Ashford Stud, perhaps the world's busiest Thoroughbred farm, where some of the planet's most booked stallions breed as many as three times a day. The breedings go on in a yawning 11,000-square-foot limestone complex topped with skylights and ringed by hedging. The complex is sectioned into quadrants. The quadrants are spoked about a glass booth that allows veterinarians and farm managers to make like air-traffic controllers and oversee successive



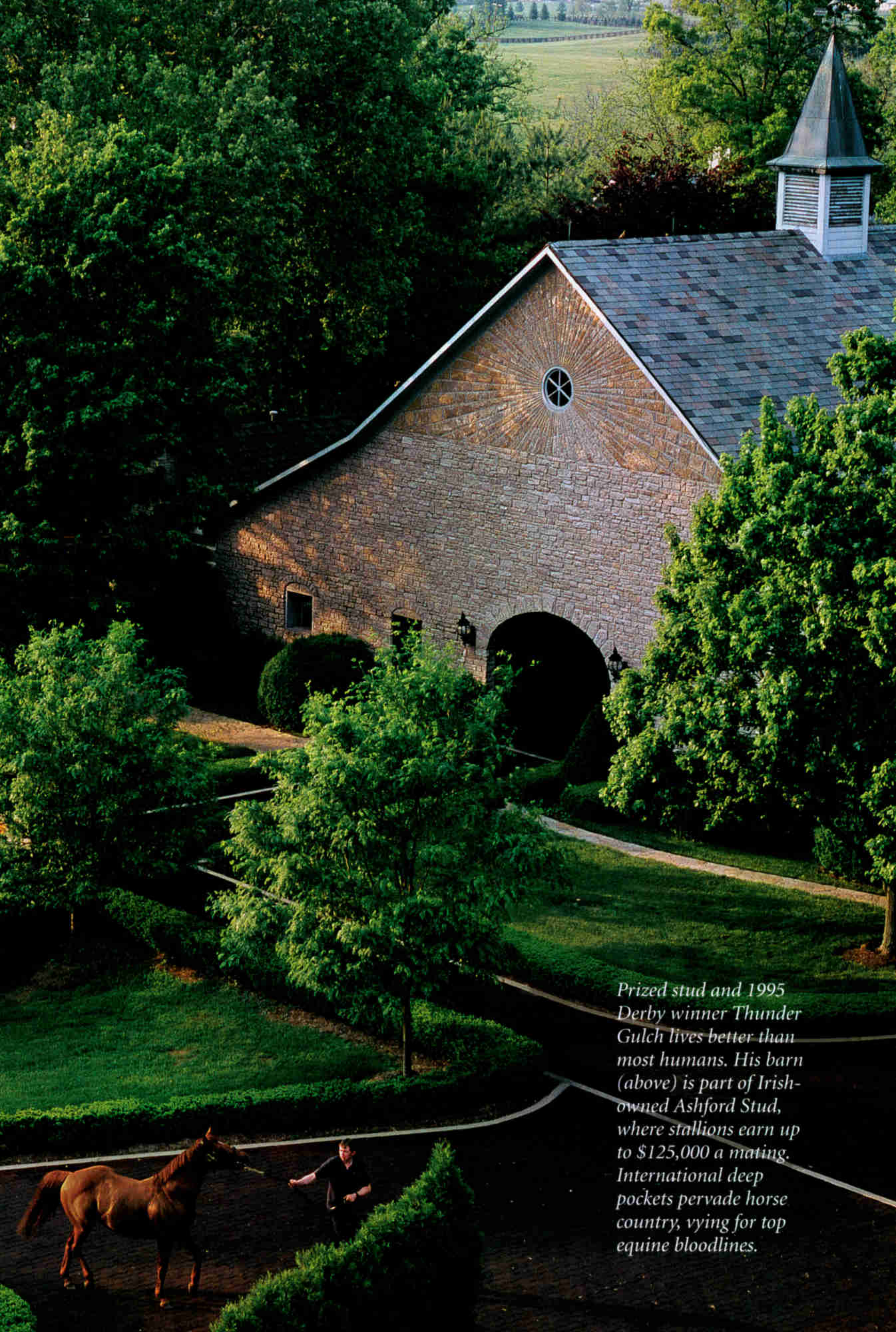
A race-day crowd gets a peek at Blue Grass Stakes contenders as they strut around Keeneland's landscaped paddock. Many top Thoroughbreds run here at Lexington's legendary track before moving on to Triple Crown events. Says premier jockey Pat Day (right), "I consider coming to Keeneland a working vacation . . . it's so beautiful."



HOMETOWN RACES







Prized stud and 1995 Derby winner Thunder Gulch lives better than most humans. His barn (above) is part of Irish-owned Ashford Stud, where stallions earn up to \$125,000 a mating. International deep pockets pervade horse country, vying for top equine bloodlines.



A foal is coming, and Smiser West, 94, waits. For 60 years West has raised thousands of foals, and he rarely misses a birth on his Waterford Farm (above)—even though most happen in wee morning hours. “People think I’m crazy, but I just love it. I want to see what they’re going to be like.”

couplings like incoming planes. “After last year’s problems,” a manager grumbles, “there’s been a lot more mares needing to get bred. People ask how we fit ’em all in.” He rubs his head and looks impatient. “I say, ‘Hell, the lads just get it done.’” Conversely, at the low end, there are sheds like the one at Golden Gate, where veteran farm manager Jimmy Boyd stands just one stallion, for “just a few” breedings, in a dusty barn space that doubles as an exercise ring. And then, somewhere in between, there are the more typical set-ups like the one at Crestwood.

It’s late April, and we are a half dozen men come together to help some dangerously large animals have sex. We are here in this old wooden “shed”—and not in some frozen-sperm repository with an artificial inseminator—because no track will let you race a horse not conceived by so-called natural cover, and because, though these horses could very naturally figure out how to “cover” themselves, as they do in the wild, they might not do it with attention to human scheduling and safety.

The idea is to produce a straight limbed, commercially attractive foal with enough speed, as the colloquialism goes, “to outrun a fat man.” The catch, if you own the mare, is

to do it without going broke. At Overbrook Farm, the world’s priciest stud, Storm Cat, books mares at half a million each—which might help explain why so many breeders

have been turning to Storm Boot, a top son of Storm Cat, who stands at Crestwood for a 30th of the cost.

The love unfolds in choreographed stages. The mares get vanned in, then soaped and lubed with gynecological precision before being exposed to the “teaser horse.” He’s a whale-shaped Morgan named Picho, whose Sisyphean task it is to suss out which mares are in the mood. Often this requires only that he nuzzle each mare’s haunches, at which point a hormonally ripe mare will let loose with a stream of “I’m yours” urine. Other times, should a mare’s biological hints seem more subtle, Picho may be asked to actually “jump” her. If she rejects the jump, then it’s Picho, and not one of Crestwood’s valued studs, that’s liable to receive a dangerous double-barreled kick. However, if she accepts the jump, poor Picho still loses out, as he’s fitted





A STAR IS BORN?

with a leather apron to ensure that his efforts, in advance of the waiting stud's, remain chaste.

The first of today's mares, Genie's Flight, receives Picho's advance by making a puddle. Next, Marc's older brother, Pope Jr., leads in a stallion (snorting and stomping) known as Service Stripe. He's a dark bay 12-year-old with a pretty fair track record and a more than pretty fair record of siring fast runners. He is not Crestwood's meanest stud—that would be Storm Boot, now fidgeting in his stall where he's been known to take bites out of his groom, or lacking such a target, out of his very own chest.

So how many men does it take to restrain a mare and get her bred?

On this day at least six. One to hobble Genie's left foreleg and strap on some protective leather hoof covers ("Mare Jordans," Marc calls them).

One to twist her nose with a buck-stopping rope-and-stick device called a twitch. One to get her to face a chest-high padded chute called the bomb shelter (used like a rodeo clown's barrel if a horse goes wild). And one to pull her tail clear so that when Service finally rears up and falls forward on Genie's back, Marc, in the role of the "pilot," can reach in to help keep Service on target and the day's breedings on time.

It is testament to the extreme routinization of this hyperbolic act—and also to the average horseman's calm in the face of everything from killer plagues to reproductive facts—that while Service chuffs and thrusts toward an abruptly gentle collapse on Genie's back, the McLean boys are holding, among other things, a discussion that goes like this: Pope Jr.: "So does that heater in the apartment need a new cap?"





Flowering crab apples burst into bloom on Manchester Farm's 300 acres. Traditional white fences need frequent repainting, a yearly expense of about \$20,000. Most area farms now opt for basic black—still elegant, and far cheaper to maintain.

Marc: "I don't know. I shut the water off. I think it's the pump."

Pope Jr.: "When was that furnace put in?"

Marc: "Oh, I don't know, that's a good question. . . . C'mon now Service, you got to squeeze it, buddy, there you go, that a boy, that a boy, good cover. Next?"

It's early May now, and like other farm managers across the Bluegrass, Marc starts his mornings by chaperoning the visit of a daily farm vet, in this case Dr. Jim Smith, from barn to barn. Here Dr. Smith checks on a horse showing signs of colic. There he checks on a newborn unable to figure out how to nurse. Mostly, though, he checks on the mares: the still empty ones to see when they'll come into heat, the newly pregnant ones to see if last year's MRLS has crept back. Thankfully it seems it hasn't, leading to an industry-wide undercurrent—you can hear it in people's voices at all the pre-Derby cocktail parties—of hope.

Maybe that MRLS was a one-time deal. Maybe it's safe now to turn toward some of the industry's other thorny issues, like how to restore an aging fan base and draw new bettors to the track. Or how to compete with the gambling public's growing love of riverboat slots. Or how to deal with a bear market in a business that feeds off excess wealth. Or how to cope with the growing monopolization of the sport's best bloodstock by a small number of Arab and Irish elites. Since entering the business in the 1980s, for example, the Maktoum brothers of Dubai and (the now late) Prince Ahmed bin Salman of Saudi Arabia have spent more than a billion dollars on Thoroughbreds, mostly in Kentucky, where the prince, the *Los Angeles Times* once reported, used to jet in with an entourage that included not just a protective food-taster but also an emergency organ donor.

Dr. Smith wheels out his gear. Marc—with an encouraging 102 of his 144 mares already in foal for 2003 and 58 of his 80 babies already on the ground for 2002—takes careful notes. Jen Stilwell, one of Crestwood's few non-Hispanic barn hands, jokes about how the last living (but soon to die) Triple Crown winner, Seattle Slew, at neighboring Hill 'n' Dale, has his own voice mail. "I don't even have voice mail!" she shrieks. "But then, I guess I'm probably a lot cheaper to breed to." Three barns later, it's more of the same, the

morning rolling out on a spool of rough humor until suddenly, after a chat about why one groom fills her pockets with peppermints (to attract the horses that won't come in) and another fills his with \$10,000 wads of cash (he doesn't trust banks), Dr. Smith looks up from his ultrasound video monitor and says, "I'm sorry, Marc, but this one's gone."

Marc lowers his clipboard and frowns. The barn hands study their boots. "This one doesn't look good either," Dr. Smith announces. And then, minutes later, he murmurs: "This one's slipped too." Marc nods—the season had been going so well—and trudges off to call his dad. Dr. Smith turns my way. "Careful now," he whispers, gently. "This isn't a good time for any more questions. That was a lot of money right there. And that's not supposed to happen. Not three in a row like that. That's really not good."

Within the hour, however, that number has grown, and Marc has taken to muttering things like "you win some, you lose some" and "it's all part of the game." At about the same time, someone calls to say that the University of Kentucky's MRLS task force has made an announcement: After a year of extensive study, it seems the caterpillars have now, without doubt, been linked to last year's outbreak; some as-yet-unknown something about them proving harmful to pregnant mares that graze them up. "Too bad that that horse is already out of the barn," Marc says, striving for humor. And then he rejoins Dr. Smith, who checks another dozen or so



A muzzle stops an itchy mare from accidentally eating eastern tent caterpillars—pests linked to a disease that causes miscarriage. Such measures help ward off the plague that could cost the industry more than 300 million dollars. They also create more work for farmhands (right), many of whom come from abroad for an equine education—and keep Bluegrass farms running.



DOWN ON THE FARM







A one-ton hoist, some shackles, and a hefty dose of anesthetics help move a thousand-pound patient from leg surgery into recovery at Rood and Riddle Equine Hospital. It's one of two major facilities that make Lexington's Fayette County an international center of horse medicine.



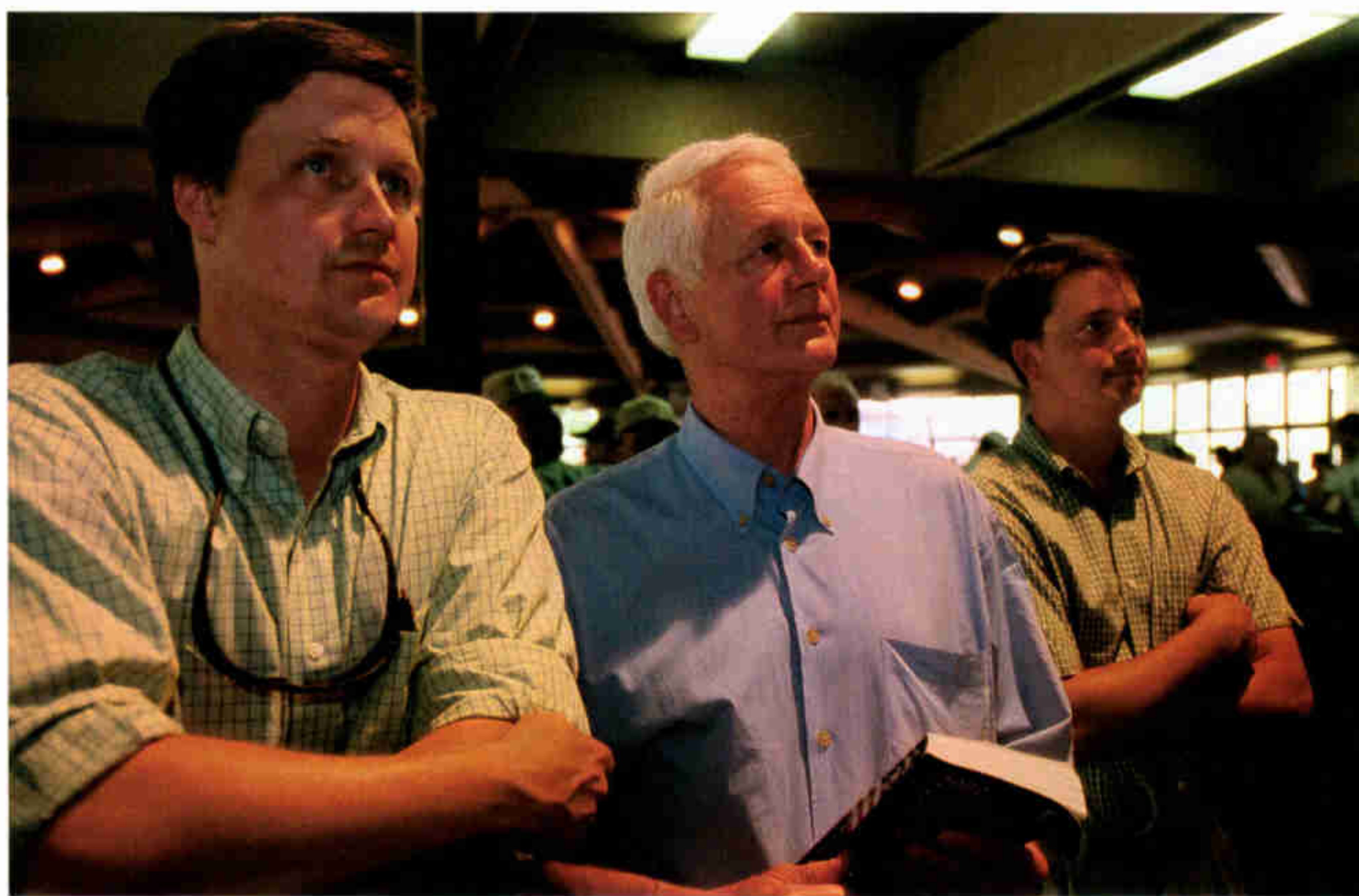
THE PAYOFF

mares and doesn't find another slipped fetus at Crestwood the rest of the day.

Further confirmation of the plague's return doesn't come until later that week, a harried call from one of the region's many wide-roving vets (some of whom drive 6,000 miles a month), the 29-year-old Jeanette McCracken, or Dr. J. She's a sharp athletic blonde who likes to say, upon a first meeting, "What, you were expecting someone with an Afro who could dunk?" She's known to some as the vet who once spied a panhandler in need of money for "food and pet shots" and so pulled over to hand him an apple and vaccinate his dog. Now she sounds frazzled, almost weepy, and she speaks of perhaps not buying a house here as she'd planned, because if things continue to go badly, "the whole industry might have to relocate," given

all the reports of fetal losses flooding in from Bourbon and Fayette and Woodford Counties to name but a few.

The response, at many farms, is dramatic. Where once some put off felling cherry trees (the caterpillars' favorite roost) because the work would be costly and no MRLS link had been proved, now even the most elegant farms, like Lane's End, owned by Will Farish, ambassador to the United Kingdom, buzz with hundreds of thousands of dollars' worth of chain-saw work. And every spare minute is given over to defensive chores like respraying fence lines and bringing in mares. What more can be done? At Sheikh Hamdan al-Maktoum's lavish Shadwell Farm, a small army of pickers has been mobilized to prune every caterpillar nest from the trees. More generally (and less



Anxiety rides with Pope McLean, Sr., (above, center), and sons Pope Jr. and Marc as they wait for sale of their colt at a Keeneland auction, where a yearling once sold for over 13 million dollars. But bargains abound at Fasig-Tipton (left). Seattle Slew, bought here for a mere \$17,500, later won the Triple Crown.

school—to Churchill Downs.

From the backside, the track's profile suggests the lines of a Mississippi paddleboat. On the infield, the grass fills with bellowing college students, many of whom seem happiest when chugging sweet mint juleps and baring their chests. In the jockeys' room, short men with exquisite balance and gorilla-grip handshakes lounge about in towels, their lockers full of enough sugarless gum, strong cigarettes, and mouthwash to let you know that a) you're still in Kentucky where tobacco is king, and b) the practice of "flipping," or throwing up to make weight, still goes on. It's Derby day, and the jocks I spy in passing include Mark Guidry, the languid veteran from Louisiana, shortly after an interview in which he held up his callused palms and said, "I ain't got no baby hands, baby." The celebrated

expensively), the answer seems to be to carry on as usual, which, about now, means a lot of mingling at catered parties and running off with the kids—who traditionally get some Derby time off from

and serious Pat Day is here too. And the fidgety Puerto Rican jock Willie Martinez is tugging at his silks, after an interview in which he mumbled a few rap lyrics—"I got my mind on my money and my money on my mind"—before quietly explaining how it feels to go down in the pack, with your bones breaking under hoof and the taste of blood in your mouth. "This was two years ago, and I was afraid I'd punctured my lung, man, like I was gonna drown in my own blood. You forget how powerful these animals are. But I've got friends who've been paralyzed, and so now, any race I walk away from, I'm like, 'I'm so lucky,' you know?"

The McLeans, meanwhile, visit in turns, with Pope Sr. tipping the track valet \$20 because the parking here is not a meritocracy, and unlike his fiscal conservatism on the farm, at the track he feels that "money really talks." Upon his return, though, he discovers that a mare called Shimmering Lace has delivered one of the season's first red bags; yet another reminder that Begin is still at risk.

And so when the Derby festivities at last simmer down after War Emblem's long-shot win, it's decided that Begin ought to be moved into the foaling barn.



Pure white Thoroughbreds are flukes of nature—and Patchen Wilkes Farm (below) claims two of only 20 ever registered. Calumet's horse cemetery (left) honors the farm's departed best—"a shrine to their spirit," says manager Tony Cissell. Their blood still runs through descendants, offering hope that the gene pool will strengthen with each new foal.

BELOVED FROM START TO FINISH



For a few days the weather turns evil and the babies don't come. It doesn't take more than a few eons of evolution to know, if you're a horse, that you don't want to go into labor when the barometer drops. Ditto for when the sun arcs high and a sight-hunting predator might more easily spot you. Thus the importance of a night watchman like Crestwood's Cecil Stricklen to monitor the mares after dark.

At some farms, Cecil might make use of a control room full of video monitors to help him keep close tabs on several stalls at once. At Crestwood, however, he goes it mostly low-tech and solo, sitting on a hay bale, in the barn's bare-bulb light, with nothing more than a few honey buns to keep him awake, his hound dog, Duke, for company, and his "foaling bucket" to help him make fast deliveries if that's what it takes. The

bucket holds painkillers, disinfectants, syringes, scissors, tail wraps, plus a length of chain for when a foal needs to be yanked out quick. Normally Cecil might pass the night pacing stall to stall and paddock to paddock. But with Begin here, he's been told to keep her in constant sight. If she drops into labor, he'll put a wake-up call in to the McLeans. If there's a problem, he'll wake Dr. J. too, and she'll speed over, no matter the time. But, come midnight on May 19, Begin hasn't begun, and so Cecil reflects. By now, he draws, the breedings and foalings are "nearly just about done" and the

WEBSITE EXCLUSIVE

Get an update on the 2003 spring foaling season and the latest research on MRLS in our Online Extra, and enjoy more Bluegrass images at nationalgeographic.com/ngm/0305.

coming July and September auctions are "gonna tell everyone around here an awful lot."

If the auctions go well—that is, if the sales auditoriums at Keeneland and elsewhere fill with well-heeled buyers and the tuxedo-clad bid spotters catch enough discreet nods in the audience to rack up a lot of seven-figure sales—then even the most ravaged farms might make out. But if senior auctioneer Ryan Mahan's gavel sounds on too many cheap offers, and even the Arab and Irish elites seem hesitant to take on more risk, then the horse world might just sink into another one of its cyclical depressions.

As it happens, when the time comes, the July auction will show enough contradictory signs to render almost any prediction incomplete. On the high side, Irishman Demi O'Byrne will raise his hand on a sales-topping 3.1-million-dollar bid for a son of Storm Cat. Yet, below that, the sale will be termed "soft." And though no one knows it yet, the 2003 event will be cancelled—due to MRLS—an unprecedented blow that, a Keeneland official predicts, will hurt nearly "every section of central Kentucky's economy."

Still, Cecil says, he remains "thrilled to be here." Because the McLeans "are pretty good folks," and he just "loves" delivering "babies" and keeping to himself, though he'll soon enough have company. That's because, in just a few hours, Begin will start to pace, her teats will start to drip, and then she'll break water, go down in her stall, and start to push. If the first thing to turtle out is a shock of red placenta, it'll be a problem. But that doesn't happen, and the foal squishes forth, with a little gentle pulling, all shivering and wet and ready to stand (or even run) in less time than it takes to read the *Daily Racing Form*.

"She gave us a healthy bay colt," Marc says, groggy and relieved after news of Begin's baby has spread the next morning and most of the farm's staff has found reason to stop by and gawk.

So could this colt, if he sells well, be enough to offset two years of MRLS?

Marc pauses. Without question, the industry's suffered another harsh season. Yet, rather than dwelling on any losses, Marc chuckles. "We're just glad this one came out right," he says. And then he tells of checking on his prized "little fella" and discovering, happily, that he'd been given a nickname. On the chalkboard nameplate outside his stall, an optimistic barn hand had already written in "Champion." □

By TAKESHI INOMATA UNIVERSITY OF ARIZONA
Photographs by the author and KENNETH GARRETT

The reign of Tan Te' K'inich, the last ruler of a little-known Maya state, crashed as abruptly as a shattered monument showing the ruler in all his glory. Fleeing his capital before an enemy attack, he and his nobles left a unique record of life at the royal court.

ACQUA

New Revelations



TECCA

of the Maya Elite



Aguateca is an archaeologist's dream site — one moment frozen in time by rapid departure and destruction.



Engulfed by humidity and mosquitoes, our international team of archaeologists recently uncovered a fortified upper-class enclave abandoned around A.D. 800. Fire—presumably set by still unidentified attackers—

had ravaged almost every building. This was the heart of Aguateca, a political center of several thousand Maya in the rain forest of what is now Guatemala (map).

Beginning about A.D. 700, a powerful Maya dynasty made Aguateca and Dos Pilas



In one of the buildings of the elite (left), we found many stone basins for grinding corn, a sign that the nobility gathered there for feasts and rituals. In another, likely a residence, Daniela Triadan dug up a charred ceramic figurine (bottom). Perhaps depicting an ancestor, it emerged intact (below).

SOCIETY GRANT

This Research Committee project is supported by your Society membership.



KENNETH GARRETT (ABOVE)

its twin capitals. But as battles for control of the area escalated (see *Geographica*, NATIONAL GEOGRAPHIC, October 2002), the dynasty hunkered down at Aguateca, probably because of its protected site at the top of an escarpment.

Eventually the enemy pressed in. The royal family packed up and fled the palace. Loyal courtiers stayed on in defense but finally dropped everything and ran—or were captured—their possessions largely left in place.







In paintings we see rulers wearing masks for rituals. Here we found the real thing for the first time.

Though artifacts filled the rapidly deserted nobles' houses, the palace lay nearly empty except for one sealed room (above). Inside we saw something astonishing: sherds of two thin ceramic ceremonial masks—the only examples ever recovered.

Enough of one survived for partial restoration (below).

Preparing to leave as the enemy neared, Tan Te' K'inich (left, in doorway), the queen, and their attendants likely hid such sacred items, apparently hoping to return. They never did.



NATIONAL GEOGRAPHIC ARTIST CHRISTOPHER A. KLEIN (LEFT); KENNETH GARRETT (ABOVE)



These artifacts tell us who created this splendid Maya art, how they worked, and how they lived.

Before we began to excavate Aguateca, we knew from Maya texts that some nobles worked as both artists and scribes. But the sheer quantity of corroborating evidence at this site surprised us. Every residence we uncovered held the remains of the



activity of artists and scribes. Working around tree roots to help keep the forest canopy intact (above), we discovered a house that contained a set of 18 stone axes of various sizes. Wear analysis suggests they were used on stone. We now think they made up the



may have hung on a piece of clothing. In Maya cosmology the monkey was the patron god of scribes.

Another god's face gives shape to a reconstructed ceramic incense burner (below) found in the same building that held the corn-grinding basins. Smashed by debris that fell during the final fire, it likely played a role in rituals.

WEBSITE EXCLUSIVE

Check out more images of Aguateca and field notes from Ken Garrett, along with related websites and resources at nationalgeographic.com/ngm/0305.



KENNETH GARRETT (ABOVE AND BELOW)

tool kit of a sculptor who carved royal monuments.

A scribe's equipment (right, with a modern paintbrush added for scale) lay in a house that also preserved more than 300 pieces of pyrite from mosaic mirrors. The chert plate and pestle and a square sandstone dish were used to grind pigments, which then may have been stored in the ceramic jar.

With holes for attachment, a finely carved two-inch-tall shell monkey's head (left)





KENNETH GARRETT (ALL)

The enemy wasn't interested merely in conquest. It wanted to wipe Aguateca off the map.

The last days of this forest enclave must have been desperate. The royal family had slipped away, and defensive walls blocked the main ceremonial street. Remaining at their posts, the nobles may have tried to tune out the impending danger by keeping up traditions such as music. Their instruments, found in every house, include this rare, nearly complete, ceramic flute (left).

Daily routine probably

offered some distraction as well. The scribe who lived in the house with the pyrite mirrors had likely been refurbishing a jester-god headband (above), a royal adornment. A similar piece appears as part of Tan Te' K'inich's regalia on his toppled stone monument (right).

When the enemy made its move, it struck like lightning, burning and departing. No one ever returned to resettle Aguateca: It was left to the rain forest and the roar of the jaguar. □



DETROIT, MICHIGAN

48222

Mail by the Pail

BY ANDREW COCKBURN PHOTOGRAPHS BY VICTOR JOSÉ COBO

Out on the Detroit River, halfway between the U.S. and Canada, Capt. Leonard Tanner turns the helm and nudges the mail boat *J. W. Westcott II* tight against the 730-foot side of the Great Lakes freighter *Canadian Miner* powering smoothly along at six miles an hour. A crewman on the freighter's deck lowers a bucket on the end of a rope and then hoists up the bag of U.S. mail that has been swiftly attached by the crew of the *Westcott*. So goes one more postal delivery in 48222, the zip code reserved for freighter crews on the Great Lakes, who pick up their mail as they pass this spot.

Accelerating so that he can break free from the wash pushing us against the giant hull, Tanner toots his whistle, which seems louder than the boat is big, and gets a mighty roar in response. "The *Roger Blough* [a 49,000-ton behemoth] has a great whistle," he remarks to deckhand David "Toby" Tozer. "I think she's the best."

"Yeah, you can feel that one down in your toenails," says Tozer, cocking an appreciative ear as the *Miner's* answering blast reverberates across the water between Windsor, Ontario, and the Detroit shoreline. "This one is pretty good though." Like the rest of the mail boat staff, Tanner and Tozer know their "lakers," the bulk cargo freighters, sometimes a thousand

Day and night, a tug called the *J. W. Westcott II* delivers mail and other supplies to freighters on the Detroit River. It's a postman that never tires, serving a zip code that never stops moving.





DETROIT, MICHIGAN



feet long, passing day and night in front of the J. W. Westcott Company office, a low whitewashed building with blue marine trim on the edge of Riverside Park, just across the railroad tracks at the bottom of Detroit's 24th Street.

On a fall day in early October, the sun is glinting off the silver towers of the Renaissance Center a couple of miles upriver, and it feels almost warm enough to light up the barbecue on the neatly trimmed lawn between office and dockside. "It's different in November," says Tanner, a veteran of the U.S. Marines and the Detroit police force. "If the wind is out of the southwest, pushing against the current, you can get water going over the boat."

Even in less severe weather, maneuvering beside the big ships can be lethally dangerous, especially if the small boat falls back, cannot pull away, and gets dragged in under the stern, close to the propeller. On October 23, 2001, just before dawn, the *Westcott* was headed for an oceangoing tanker—a "salty"—moving upriver. But the tanker did not slow down, and, in circumstances that are still unclear, the *Westcott* was suddenly flipped over. It sank in seconds, drowning the crew of two—Cathy Nasiatka, the experienced captain, and deckhand Dave Lewis. (The *Westcott* has since been refloated and repaired.)

"When Cathy and Dave were drowned, we had a tremendous wave of sympathy from around the lakes, messages, calls, visits," says company head Jim Hogan, whose great-grandfather started the business in 1874, using a rowboat to meet ships midstream. "It really showed how close people feel to this operation, even though e-mail and cell phones have cut down on the amount of mail."

Not surprisingly, relationships with the addressees on the mail in



J. W. WESTCOTT COMPANY COLLECTION

The *J. W. Westcott II* uses all of its 248 horses to court the huge ships that ply the Great Lakes. When the boat's namesake, John Ward Westcott (above), began delivering messages to passing ships in 1874, he had only two oars and a strong back.



Calm waters make for an easy delivery (left), but even a river can get rough seas (below), and safety is never guaranteed. Almost two years ago the *Westcott* capsized and sank while trying to pull alongside a tanker. Though the tug was resurrected, two crew members died in the accident.

the sorting room are relatively informal. “Can you please forward any mail going to the Buckeye for me to the Reserve?” reads a crewman’s note pinned on the wall. “I’m on the Reserve for a few weeks and I’ll let you know when I go back to the Buckeye.” Another room is filled with stocks of coffee, toilet paper, lightbulbs, and other necessities kept handy for customers, who spend two months on board their ships, one month off, and have little opportunity to stop a 40,000-ton freighter to go ashore or to take time off when loading or unloading in port.

This is the hub of a community of about 5,000 sailors in continual motion. From April through mid-December they shuttle back and forth across the Great Lakes, from tiny remote iron ore ports on the coast of western Lake Superior, to Lake Michigan or Lake Huron for cargoes of construction stone or gravel, to Lake Erie’s historic industrial ports like Toledo and Cleveland or even, especially on the Canadian grain boats, out to the oceans via the St. Lawrence Seaway. Sooner or later they all pass by here and look for the little mail boat to dart out from the dockside.

It is a community that is slowly shrinking. “This is the rust belt, a forgotten part of the country,” reflects Hogan, sitting behind what had once been his great-grandfather’s desk. “I guess its heyday was in the forties and fifties, when everything ran on steel. There are so many fewer ships now [about 60 in the U.S. laker fleet, with another 80 Canadian ships], although they have gotten a lot bigger.”

I heard a similar lament one evening high above the water in the



48222

WESTCOTT

BUILT: 1949

LENGTH: 45 feet

TOP SPEED: 12 mph

ON DUTY: April through mid-December, 24 hours a day

MAIL DELIVERED IN 1950: almost a million pieces

MAIL DELIVERED IN 1998: 400,000 pieces



DETROIT, MICHIGAN

pilothouse of the *Buckeye*, a 698-footer laden with 23,500 tons of iron ore pellets headed for Toledo. “Every time you look round, they’ve cut more men from the crews,” grumbled Capt. Edward “Bud” Tamborski, as he eased the huge vessel down the river to Lake Erie. “This industry,” he concluded, referring to lake shipping, “is dying.”

The captain’s gloomy mood became more understandable when I found out that earlier, as I was climbing aboard from the *Westcott*, the freighter’s steering mechanism had momentarily failed. The *Buckeye*, with me halfway up the ladder, had come within a few seconds of plowing into downtown Detroit when the helmsman regained control. Blissfully ignorant of the near disaster, I had wondered why Tamborski seemed a little distracted when we met. Now, in the fading glow of a pink sunset, we were slipping silently along at just under 12 miles an hour, past the dramatic metal towers of the steel plants, refineries, and power stations lining the shore of what still looks like the industrial heartland of America. In the darkened pilothouse, lit only by the glow from the instruments, the quiet conversation was of storms on Lake Superior—25-foot waves—and the trickiness of navigating up the river to the ore docks in Cleveland, “like a snake,” and how, working two months on and one month off, laker crews don’t have weekends like most people, and whether the items they ordered from that catalog will be in the mailbag the next time they pass that way.

No one sounded like they’d rather be living somewhere else. □



Reading mail by light of an open window, a crewman on a World War II-era steamer enjoys the fruits of the *Westcott*'s labor. The tug may cut a quieter line than Detroit's skyscrapers and refineries, but for many a passing sailor the *Westcott* is the top landmark on the waterfront.



WEBSITE EXCLUSIVE

Find more 48222 images along with field notes and resources at nationalgeographic.com/ngm/0305. Tell us why we should cover **YOUR FAVORITE ZIP CODE** at nationalgeographic.com/ngm/zipcode/0305.

I thought diet and exercise were enough to lower my cholesterol. Turned out I needed more.



Now I take my family history of high cholesterol and heart disease a lot more seriously. Because even though I was doing everything right, my cholesterol was still too high, and I had a heart attack. As I was recovering, I asked my doctor about adding ZOCOR. He said ZOCOR, along with a healthy diet and exercise, could really lower cholesterol. And it's working. Now my cholesterol is right where it should be. And so am I.

ZOCOR is an effective medicine that along with diet and exercise can significantly lower total cholesterol. A clinical study among people with high cholesterol and heart disease found 42% fewer deaths from heart attack among those taking ZOCOR.* One tablet, taken once a day, can help people with high cholesterol and heart disease live longer, healthier lives.

Important considerations: ZOCOR is a prescription medicine and isn't right for everyone, including women who are nursing or pregnant or who may become pregnant, anyone with liver problems, and people who are allergic to any ingredients of ZOCOR. Unexplained muscle pain or weakness could be a sign of a rare but serious side effect and should be reported to your doctor right away. Your doctor may do blood tests before and during treatment with ZOCOR to check for liver problems. To avoid serious side effects, discuss with your doctor medicine or food you should avoid while on ZOCOR (see details immediately following this ad).

Ask your doctor if ZOCOR is right for you. For more information and the free *Guide for Managing High Cholesterol*, call 1-888-MERCK-68 or visit zocor.com.

ZOCOR. More than 10 years of experience and 140 million prescriptions filled.

YOUR RESULTS MAY VARY.

PLEASE READ THE ADDITIONAL INFORMATION ABOUT ZOCOR IMMEDIATELY FOLLOWING THIS AD.

*42% reduction based on 111/2,221 (ZOCOR) vs 189/2,223 (placebo).

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To find out if you qualify call 1-888-MERCK-68.

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(SIMVASTATIN)

It's your future. Be there.

ZOCOR[®]

(SIMVASTATIN)

PLEASE READ THIS SUMMARY CAREFULLY, AND THEN ASK YOUR DOCTOR ABOUT ZOCOR. NO ADVERTISEMENT CAN PROVIDE ALL THE INFORMATION NEEDED TO PRESCRIBE A DRUG. THIS ADVERTISEMENT DOES NOT TAKE THE PLACE OF CAREFUL DISCUSSIONS WITH YOUR DOCTOR. ONLY YOUR DOCTOR HAS THE TRAINING TO WEIGH THE RISKS AND BENEFITS OF A PRESCRIPTION DRUG FOR YOU.

USES OF ZOCOR

ZOCOR is a prescription drug that is indicated as an addition to diet for many patients with high cholesterol when diet and exercise are inadequate. For patients with coronary heart disease (CHD) and high cholesterol, ZOCOR is indicated as an addition to diet to reduce the risk of death by reducing coronary death; to reduce the risk of heart attack; to reduce the risk for undergoing cardiac procedures (coronary artery bypass grafting and percutaneous transluminal coronary angioplasty); and to reduce the risk of stroke or transient ischemic attack (TIA).

WHEN ZOCOR SHOULD NOT BE USED

Some people should not take ZOCOR. Discuss this with your doctor.

ZOCOR should not be used by patients who are allergic to any of its ingredients. In addition to the active ingredient simvastatin, each tablet contains the following inactive ingredients: cellulose, lactose, magnesium stearate, iron oxides, talc, titanium dioxide, and starch. Butylated hydroxyanisole is added as a preservative.

Patients with liver problems: ZOCOR should not be used by patients with active liver disease or repeated blood test results indicating possible liver problems. (See WARNINGS.)

Women who are or may become pregnant: Pregnant women should not take ZOCOR because it may harm the fetus. **Women of childbearing age should not take ZOCOR unless it is highly unlikely that they will become pregnant.** If a woman does become pregnant while on ZOCOR, she should stop taking the drug and talk to her doctor at once.

Women who are breast-feeding should not take ZOCOR.

WARNINGS

Muscle: Tell your doctor right away if you experience any unexplained muscle pain, tenderness, or weakness at any time during treatment with ZOCOR so your doctor can decide if ZOCOR should be stopped. Some patients may have muscle pain or weakness while taking ZOCOR. Rarely, this can include muscle breakdown resulting in kidney damage. The risk of muscle breakdown is greater in patients taking certain other drugs along with ZOCOR:

- Cyclosporine, itraconazole, ketoconazole, erythromycin, clarithromycin, HIV protease inhibitors, the antidepressant nefazodone, or large quantities of grapefruit juice (>1 quart daily), particularly with higher doses of ZOCOR.
- Gemfibrozil, other fibrates, or lipid-lowering doses (≥ 1 g/day) of niacin, particularly with higher doses of ZOCOR.
- Amiodarone or verapamil with higher doses of ZOCOR.

The risk of muscle breakdown is greater at higher doses of simvastatin.

Because the risk of muscle side effects is greater when ZOCOR is used with the products listed above, the combined use of these products should be avoided unless your doctor determines the benefits are likely to outweigh the increased risks.

If your doctor determines that the benefits of combined use of ZOCOR with gemfibrozil, other fibrates, or niacin likely outweigh the increased risk of muscle problems, the dose of ZOCOR should not exceed 10 mg daily. No more than 10 mg/day of ZOCOR should be taken with cyclosporine.

The combined use of verapamil or amiodarone with doses above ZOCOR 20 mg should be avoided unless your doctor determines the benefits outweigh the increased risk of muscle breakdown.

Your doctor should also carefully monitor for any muscle pain, tenderness, or weakness, particularly during the initial months of therapy and if the dose of either drug is increased. Your doctor also may monitor the level of certain muscle enzymes in your body, but

there is no assurance that such monitoring will prevent the occurrence of severe muscle disease.

The risk of muscle breakdown is greater in patients with kidney problems or diabetes.

If you have conditions that can increase your risk of muscle breakdown, which in turn can cause kidney damage, your doctor should temporarily withhold or stop ZOCOR[®] (simvastatin). Also, since there are no known adverse consequences of briefly stopping therapy with ZOCOR, treatment should be stopped a few days before elective major surgery and when any major acute medical or surgical condition occurs. Discuss this with your doctor, who can explain these conditions to you.

Liver: About 1% of patients who took ZOCOR in clinical trials developed elevated levels of some liver enzymes. Patients who had these increases usually had no symptoms. Elevated liver enzymes usually returned to normal levels when therapy with ZOCOR was stopped.

In the ZOCOR Survival Study, the number of patients with more than 1 liver enzyme level elevation to greater than 3 times the normal upper limit was no different between the ZOCOR and placebo groups. Only 8 patients on ZOCOR and 5 on placebo discontinued therapy due to elevated liver enzyme levels. Patients were started on 20 mg of ZOCOR, and one third had their dose raised to 40 mg.

Your doctor should perform routine blood tests to check these enzymes before you start treatment with ZOCOR and periodically thereafter (for example, semiannually) for your first year of treatment or until 1 year after your last elevation in dose. Patients titrated to the 80-mg dose should receive an additional test at 3 months. If your enzyme levels increase, your doctor should order more frequent tests. If your liver enzyme levels remain unusually high, your doctor should discontinue your medication.

Tell your doctor about any liver disease you may have had in the past and about how much alcohol you consume. ZOCOR should be used with caution in patients who consume large amounts of alcohol.

PRECAUTIONS

Before starting treatment with ZOCOR, try to lower your cholesterol by other methods such as diet, exercise, and weight loss. Ask your doctor about how best to do this. Any other medical problems that can cause high cholesterol should also be treated.

Drug Interactions: Because of possible serious drug interactions, it is important to tell your doctor what other drugs you are taking, including those obtained without a prescription. You should also tell other doctors who are prescribing a new medicine for you that you are taking ZOCOR.

ZOCOR can interact with the following:

- Itraconazole
- Ketoconazole
- Erythromycin
- Clarithromycin
- HIV protease inhibitors
- Nefazodone
- Cyclosporine
- Large quantities of grapefruit juice (>1 quart daily)

The risk of myopathy is also increased by the following lipid-lowering drugs that can cause myopathy when given alone:

- Gemfibrozil
- Other fibrates
- Niacin (nicotinic acid) (≥ 1 g/day)

The risk of muscle breakdown is increased with other drugs:

- Amiodarone
- Verapamil

Some patients taking lipid-lowering agents similar to ZOCOR and coumarin anticoagulants (a type of blood thinner) have experienced bleeding and/or increased blood clotting time. Patients taking these medicines should have their blood tested before starting therapy with ZOCOR and should continue to be monitored.

Central Nervous System Toxicity; Cancer, Mutations, Impairment of Fertility: Like most prescription drugs, ZOCOR was required to be tested on animals before it was marketed for human use. Often these tests were designed to achieve higher drug concentrations than humans achieve at recommended dosing. In some tests, the animals had damage to the nerves in the central nervous system. In studies of mice with high doses of ZOCOR, the likelihood of certain types of cancerous tumors increased. No evidence of mutations or damage to genetic material has been seen. In 1 study with ZOCOR, there was decreased fertility in male rats.

Pregnancy: Pregnant women should not take ZOCOR because it may harm the fetus.

Safety in pregnancy has not been established. In studies with lipid-lowering agents similar to ZOCOR, there have been rare reports of birth defects of the skeleton and digestive system. Therefore, women of childbearing age should not

take ZOCOR® (simvastatin) unless it is highly unlikely they will become pregnant. If a woman does become pregnant while taking ZOCOR, she should stop taking the drug and talk to her doctor at once. The active ingredient of ZOCOR did not cause birth defects in rats at 3 times the human dose or in rabbits at 3 times the human dose.

Nursing Mothers: Drugs taken by nursing mothers may be present in their breast milk. Because of the potential for serious adverse reactions in nursing infants, a woman taking ZOCOR should not breast-feed. (See WHEN ZOCOR SHOULD NOT BE USED.)

Pediatric Use: ZOCOR is not recommended for children or patients under 20 years of age.

Geriatric Use: Higher blood levels of active drug were seen in elderly patients (70–78 years of age) compared with younger patients (18–30 years of age) in 1 study. In other studies, the cholesterol-lowering effects of ZOCOR were at least as great in elderly patients as in younger patients, and there were no overall differences in safety between elderly and younger patients over the 20–80 mg/day dosage range.

SIDE EFFECTS

Most patients tolerate treatment with ZOCOR well; however, like all prescription drugs, ZOCOR can cause side effects, and some of them can be serious. Side effects that do occur are usually mild and short-lived. Only your doctor can weigh the risks versus the benefits of any prescription drug. In clinical studies with ZOCOR, less than 1.5% of patients dropped out of the studies because of side effects. In a large, long-term study, patients taking ZOCOR experienced similar side effects to those patients taking placebo (sugar pills). Some of the side effects that have been reported with ZOCOR or related drugs are listed below. This list is not complete. Be sure to ask your doctor about side effects before taking ZOCOR and to discuss any side effects that occur.

Digestive System: Constipation, diarrhea, upset stomach, gas, heartburn, stomach pain/cramps, anorexia, loss of appetite, nausea, inflammation of the pancreas, hepatitis, jaundice, fatty changes in the liver, and, rarely, severe liver damage and failure, cirrhosis, and liver cancer.

Muscle, Skeletal: Muscle cramps, aches, pain, and weakness; joint pain; muscle breakdown.

Nervous System: Dizziness, headache, insomnia, tingling, memory loss, damage to nerves causing weakness and/or loss of sensation and/or abnormal sensations, anxiety, depression, tremor, loss of balance, psychic disturbances.

Skin: Rash, itching, hair loss, dryness, nodules, discoloration.

Eye/Senses: Blurred vision, altered taste sensation, progression of cataracts, eye muscle weakness.

Hypersensitivity (Allergic) Reactions: On rare occasions, a wide variety of symptoms have been reported to occur either alone or together in groups (referred to as a syndrome) that appeared to be based on allergic-type reactions, which may rarely be fatal. These have included 1 or more of the following: a severe generalized reaction that may include shortness of breath, wheezing, digestive symptoms, and low blood pressure and even shock; an allergic reaction with swelling of the face, lips, tongue, and/or throat with difficulty swallowing or breathing; symptoms mimicking lupus (a disorder in which a person's immune system may attack parts of his or her own body); severe muscle and blood vessel inflammation, sometimes including rash; bruises; various disorders of blood cells (that could result in anemia, infection, or blood clotting problems) or abnormal blood tests; inflamed or painful joints; hives; fatigue and weakness; sensitivity to sunlight; fever, chills; flushing; difficulty breathing; and severe skin disorders that vary from rash to a serious burn-like shedding of skin all over the body, including mucous membranes such as the lining of the mouth.

Other: Loss of sexual desire, breast enlargement, impotence.

Laboratory Tests: Liver function test abnormalities including elevated alkaline phosphatase and bilirubin; thyroid function abnormalities.

NOTE: This summary provides important information about ZOCOR. If you would like more information, ask your doctor or pharmacist to let you read the prescribing information and then discuss it with them.

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A vertical photograph of a dense forest with tall, thin trees and a thick canopy of green leaves. The lighting is soft, suggesting a misty or overcast day.

The most dangerous animals in the forest don't live there.

The Smokey Bear logo, featuring a bear's face wearing a fireman's hat with the name 'SMOKEY' on it.

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The Ad Council logo, which includes the word 'Ad' above 'Council' inside a square border.The UAS logo, which includes the letters 'UAS' inside a circular border.

Final Edit



HIGH STAKES IN THE BLUEGRASS

Win, Place, Show Off

A faded floppy isn't exactly the wardrobe choice photographer Melissa Farlow expected to see in Churchill Downs' clubhouse courtyard, where the well dressed put themselves on display on Kentucky Derby day. Many of the 90,000 fans holding standing-room-only tickets end up here without a view of the race, but with a great view of "the hat parade," says Melissa. The casually dressed usually head for the Downs' moshpit-like infield instead.

Photographing in the clubhouse was a challenge—Melissa wanted to capture fans in their unposed natural state. "It's hard when people are aware of the cameras," she says. "They go to the parade to be seen. Their plumage is out. They *want* their picture taken."

WEBSITE EXCLUSIVE

Cut it or keep it? Find out what tipped the balance for this photo—and zoom in on more images from the Bluegrass—at nationalgeographic.com/ngm/0305.

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MAYFLIES

Bug Hunter

“Mayflies will molt on any solid surface, including my face, my clothes, and my camera,” says Hungarian biologist **József L. Szentpéteri**. He often found himself covered with molting males (and their ghostly shed skins) while shooting the insects’ spectacular and fleeting life cycle on his country’s Tisza River. He took up photography “to become a more versatile biologist,” adding to a résumé that includes sewing and embroidering traditional folk costumes.

TAMÁS SZENTPÉTERI



EVEREST

Perils of the High Life

Or worse, a steady diet of potatoes



BERT L. FOX, NGS STAFF

Flying more than 22,000 feet above sea level in an unpressurized helicopter (above right), photographer **Robb Kendrick** became so engrossed in taking pictures that he forgot about the thin air. "Then I saw my interpreter, Ang Temba Sherpa, who has



ANG TEMBA SHERPA

summitted Everest, using our oxygen tank," says Robb. "Oops, I thought, I better use it too."

Robb, who was photographing the Sherpas' home terrain, had few problems adapting to the altitude, except for having blood vessels in his left eye break during the flight, a common symptom at high elevations. "It wasn't painful, but I noticed afterward that my vision wasn't quite clear," he says. "My specialist says it can take six months to heal." But Robb slept and ate well in Nepal, even if he had potatoes, the Sherpa staple, too often for pleasure.

Picture editor **Bert Fox** spent more than a year pulling together this issue's Everest package. He went to New Zealand to meet Sir Edmund and Lady Hillary (left). "I'd never spent time with anyone who's on the currency of his country," says Bert. "Yet he's an everyman, not a rock star—a national treasure you might see in a grocery store."

An exhibit celebrating the 50th anniversary of Hillary's ascent of Everest is on display until September 1 in Explorers Hall at the Society's Washington, D.C., headquarters.

WORLDWIDE

Photographer **Melissa Farlow** says she was "one of those little girls who ran around pretending they were a horse." She even had her own pony. But hanging around massive Thoroughbreds in Kentucky made her nervous until she came face-to-face with newborn

foals. "Having a little one come up and nuzzle me, maybe take a curious nip—I lost the fear," she says. Author **Shane DuBow** (below, with Melissa), knows about facing down fear: He once interviewed the very bank robber who'd held a gun to his head.

Though he had little previous equine experience, he was soon leading horses into a stable, holding foals for vets, even betting at the track. But luck eluded him: "I didn't cash a single ticket."

Irish-born **Andrew Cockburn** has spent years covering the Mideast, not the Midwest, so a feature on a Great Lakes mail boat gave him insights into a new world. "It was like going to a mysterious, unexplored country," he says, "and easier than getting around Libya."



POPE MCLEAN, JR.

WEBSITE EXCLUSIVE

Find more stories from our authors and photographers, including their best, worst, and quirkiest experiences, at nationalgeographic.com/ngm/0305.

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WAS JUST THE BEGINNING.

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Flashback



BRITISH MUSEUM, LONDON

AGUATECA

And Chico Makes Three

Anne Cary Maudslay, newly married to English archaeologist Alfred Maudslay, admires an eighth-century Maya stela at Quiriguá, Guatemala, southeast of Aguateca, in 1894. While Mr. Maudslay busied himself with Quiriguá's carvings—including the tallest stela in the Maya world, more than twice the height of this one—his wife cooked, gave first aid to the locals, wrote detailed journals, and adopted a baby squirrel she named Chico. "When not cuddled up asleep in my hand," she wrote, "he was rushing about the house, prying into all corners, amusing my lonely days by his pretty ways." Chico lived two years as their pet back in England.

WEBSITE EXCLUSIVE

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